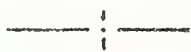


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CATALOGUE

OF THE

New Hampshire College



OF

Agriculture and Mechanic Arts.

1890-92.

CALENDAR.

1892.

- September 8. First term of fifteen weeks began — Thursday morning.
December 21. First term ends — Wednesday noon.

WINTER VACATION OF FOUR WEEKS.

1893.

- January 19. Second term of eleven weeks begins — Thursday morning.
April 5. Second term ends — Wednesday noon.

SPRING VACATION OF ONE WEEK.

- April 13. Third term of eleven weeks begins — Thursday morning.
April 18. Smyth Prize Reading and Speaking — Tuesday evening.
June 22-23. Annual Examinations.
June 26-27. Examinations for Admission, — in Hanover, beginning Monday at 3 P. M.
June 27-28. Examinations for Admission, — in Durham, beginning Tuesday at 9 A. M.

SUMMER VACATION OF TEN WEEKS.

- September 5-6. Examinations for Admission, — in Durham, beginning Tuesday at 9 A. M.
September 7. First term of fifteen weeks begins — Thursday morning.
December 20. First term ends — Wednesday night.

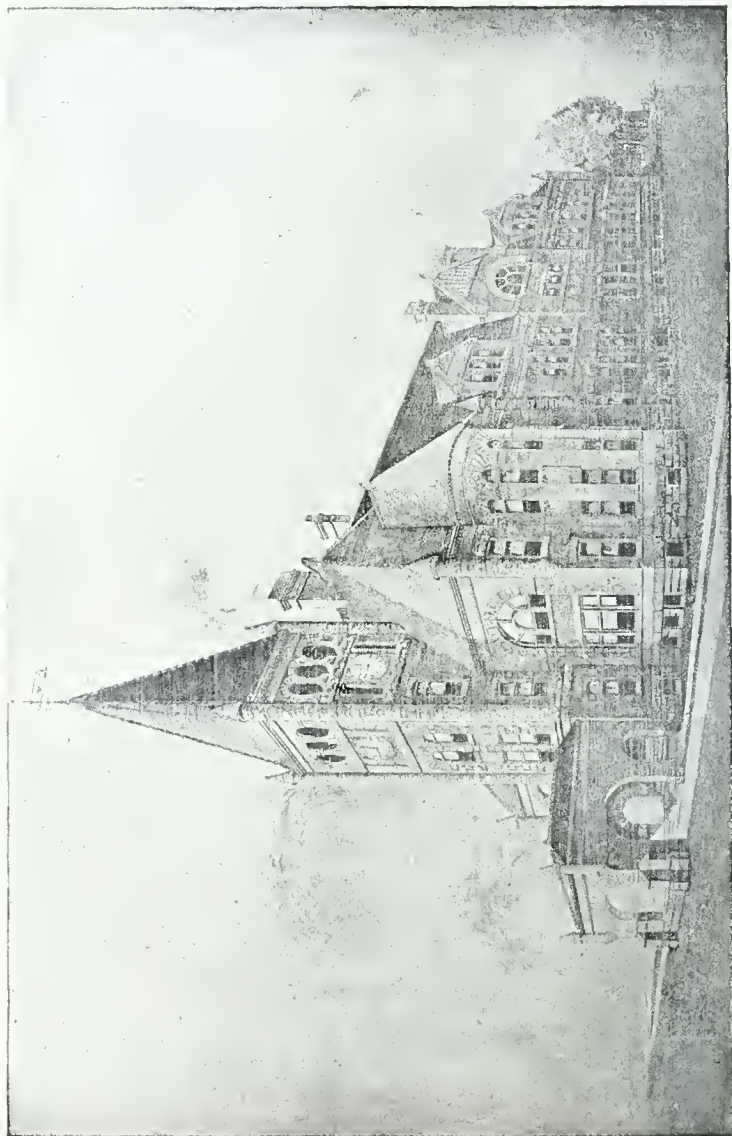
WINTER VACATION OF THREE WEEKS.

1894.

- January 11. Second term of ten weeks begins — Thursday morning.
March 21. Second term ends — Wednesday night.

SPRING VACATION OF ONE WEEK.

- March 29. Third term of ten weeks begins — Thursday morning.
June 7. Third term ends — Thursday coming on or nearest June 7.



MAIN COLLEGE BUILDING.

CATALOGUE

OF THE

NEW HAMPSHIRE

COLLEGE OF AGRICULTURE

AND THE

MECHANIC ARTS,

1890-92.

CONCORD, N. H. :

IRA C. EVANS, PRINTER, 13 AND 15 CAPITOL STREET.

1892.

BOARD OF TRUSTEES.

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CATALOGUE
OF THE
NEW HAMPSHIRE
COLLEGE OF AGRICULTURE AND THE MECHANIC ARTS,
1890-1892.*

At the session of the Legislature of New Hampshire in 1866, an act was passed establishing the "New Hampshire College of Agriculture and the Mechanic Arts," on the basis of the congressional land grant, and authorizing its location in Hanover and connection with Dartmouth College.

In accordance with this act the institution was organized under a board of trustees appointed partly by the governor and council, and partly by the corporation of Dartmouth College.

The act of Congress, by virtue of which it was established, provides that its "leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts * * * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."

An act of Congress, approved August 30, 1890, provides an additional appropriation, which for the present year is eighteen

* As the report previous to this was made Oct. 1, 1890, this catalogue necessarily contains the names of all students connected with the college between Oct. 1, 1890, and Nov. 1, 1892.

thousand dollars, and is to be increased until it becomes twenty-five thousand dollars a year. This money is to be applied "to instruction in Agriculture, the Mechanic Arts, the English Language, and the various branches of Mathematical, Physical, Natural, and Economic Science, with special reference to their applications in the industries of life, and to the facilities for such instruction."

At the session of the Legislature of New Hampshire in 1891, acts were passed severing the connection with Dartmouth College and removing the State College from Hanover to Durham; accepting the Benjamin Thompson estate, which was then of the value of about four hundred thousand dollars, and accumulating at four per cent compound interest will be available as an endowment, in 1910; and providing one hundred thousand dollars to be used with certain other sums in the erection of buildings.

These buildings are so near completion as to make it certain that in September, 1893, the college work will begin at Durham, with shops, laboratories, and other facilities found at the best technical schools.

The necessary transfers will be made during the summer vacation, and will not interfere with the college work of the preceding or the succeeding year.

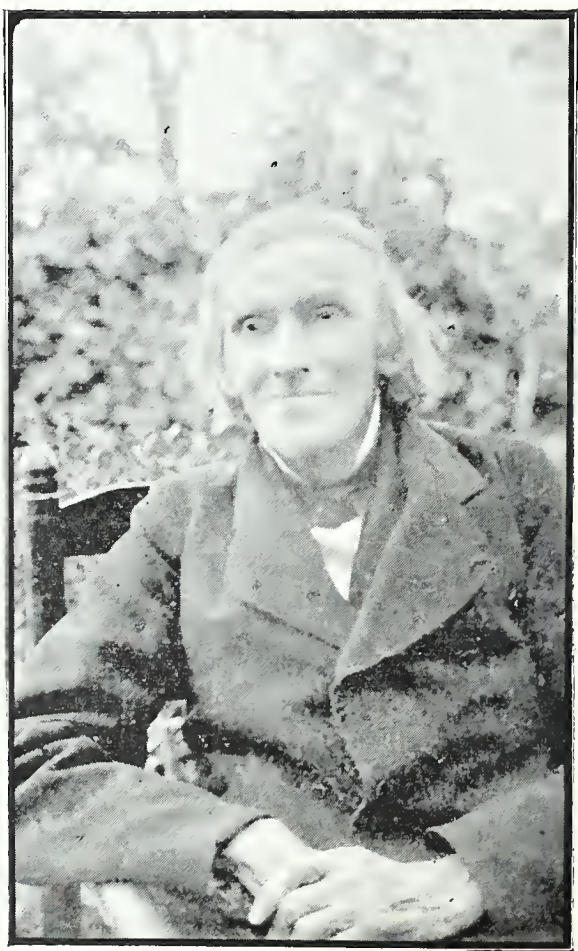
The college is carrying out the provisions of the acts of Congress in the following ways:

First. It gives a practical and scientific education, which is of use in all the professions and industrial pursuits.

Second. It gives five courses of study:

- I. Course in Agriculture.
- II. Course in Chemistry.
- III. Course in Mechanical Engineering.
- IV. Course in Electrical Engineering.
- V. General Course.

The General Course is arranged with a series of electives which can be taken by women in place of shop work and surveying.



Benjamin Thompson.

FACULTY.

HON. LYMAN D. STEVENS, *President.*

CHARLES H. PETTEE, A. M., C. E., *Dean and Professor of Mathematics and Civil Engineering.*

REV. HENRY G. JESUP, A. M., *Professor of Natural History.*

CLARENCE W. SCOTT, A. M., *Professor of the English Language and Literature.*

GEORGE H. WHITCHER, B. S., *Professor of Agriculture.*

CLARENCE M. WEED, D. Sc., *Professor of Zoölogy and Entomology.*

ALBERT H. WOOD, B. S., *Associate Professor of Agriculture.*

FRED W. MORSE, B. S., *Professor of Organic Chemistry.*

CHARLES L. PARSONS, B. S., *Professor of General and Analytical Chemistry.*

ALBERT KINGSBURY, M. E., *Professor of Mechanical Engineering.*

GEORGE L. TEEPLE, M. E., *Instructor in Electrical Engineering and Physics.*

EDWIN B. DAVIS, B. L., *Instructor in Modern Languages.*

CHARLES H. HITCHCOCK, PH. D., *Instructor in Geology.*

SAURIN J. BLANPIED, A. M., *Instructor in Elocution.*

JOHN N. BROWN, *Foreman of Machine Work.*

ALLEN G. LOWELL, *Foreman of Wood Work.*

STUDENTS.

CLASS OF 1891.

Name.	Residence.	Room.
Cole, Ernest Gowell,	Hampton, N. H.,	C. H. 4.
Everett, Russell Marden,	Chester, N. H.,	C. H. B.
Kaleher, William Edward,†	Hanover, N. H.,	Mr. Kaleher's.
Stone, Edward Payson,	Canaan Centre, N. H.,	C. H. B.

CLASS OF 1892.

Barker, Percy Lovejoy,	Milford, N. H.,	C. H. 13.
Fuller, Fred Driggs,	Hanover, N. H.,	Mr. Fuller's.
Hall, Harry Hibbard,‡	Lisbon, N. H.,	C. H. 15.
Hough, Arthur Bennersett,	Lebanon, N. H.,	C. H. 7.
Stone, Edward Monroe,	Marlborough, N. H.,	C. H. A.

CLASS OF 1893.

Britton, Wilton Everett,	Keene, N. H.,	C. H. 9.
Brown, Charles Patten,†	Hanover, N. H.,	Mr. Brown's.
Bryant, Frank John,	Enfield, N. H.,	C. H. B.
Fitts, George Dexter,	Hanover Centre, N. H.,	A. H. 1.
Freeman, George Washington,	Saco, Me.,	C. H. B.
Hewitt, Charles Elbert,	Hanover, N. H.,	C. H. 9.
Hubbard, Charles Lincoln,	Fitzwilliam, N. H.,	C. H. 12.
James, Orrin Moses,	Northwood, N. H.,	C. H. A.
Mason, Erskine*	Stamford, Conn.,	C. H. 6.
Smith, Arthur Whitmore,	Norwich, Vt.,	C. H. 9.

CLASS OF 1894.

Berry, Walter Lincoln,	Lebanon, N. H.,	C. H. 15.
Brown, Bert Sargent,†	Hanover, N. H.,	Mr. Brown's.
Brown, Delia Evelyn,	Hanover, N. H.,	Mr. Brown's.
Clark, Joseph Roger,	Derry, N. H.,	A. H. 2.
Culver, Arthur Charles,	West Lebanon, N. H.,	Mr. Newton's.

* Deceased.

† Partial course.

‡ Special course.

Name.	Residence.	Room.
Davis, Ernest Solomon,	South Londonderry, Vt.,	A. H. 4.
Fuller, Albert Eugene,	South Londonderry, Vt.,	A. H. 4.
Gunn, Fred Willis,	Keene, N. H.,	C. H. 9.
Haskell, Fred William,	Lebanon, N. H.,	C. H. 7.
Hill, Henry Elmer,	Plainfield, Vt.,	C. H. B.
Howe, Frederic William,	Hollis, N. H.,	C. H. 4.
Lang, John Bickford,	Franklin Falls, N. H.,	C. H. 4.
Russell, William Fenno,	Lebanon, N. H.,	Mr. Lowell's.
Swallow, Frank Herbert,	Hollis, N. H.,	Mr. Lowell's.
Swallow, Lucy Evelyn,	Hollis, N. H.,	Mr. Lowell's.
Trow, Charles Arthur,	Mont Vernon, N. H.,	C. H. 10.

CLASS OF 1895.

Adams, Frank Stanley,	Gilsum, N. H.,	C. H. 11.
Austin, Frank Eugene,	Amesbury, Mass.,	Mr. Howard's.
Britton, Frank Clifton,	Keene, N. H.,	C. H. 9.
Caverno, John Lewis,	Lee, N. H.,	C. H. 15.
Hutchinson, Joseph Perkins,	Norwich, Vt.,	Mr. Cobb's.
Stearns, Henry Milton Bruce,	Rindge, N. H.,	C. H. B.
Tabor, Hugh Burdette,	Hanover, N. H.,	Mr. Tabor's.
Viau, Emma Marie.†	Hanover, N. H.,	Mr. Viau's.
Warden, Herbert Andrew,	Hanover, N. H.,	C. H. 15.
White, Arthur Alford,	Marlborough, N. H.,	A. H. 6.
Wood, John Hutchinson,	Norwich, Vt.,	Mr. Cobb's.

CLASS OF 1896.

Barney, Harlan Winfred,	Grafton, N. H.,	A. H. 6.
Smith, Cyrus Everett,†	Hanover, N. H.,	C. H. 20.
Sprague, James Thatcher,	Hinsdale, N. H.,	C. H. 10.
Storrs, Adna David,	Hanover, N. H.,	Mr. Storrs's.
Wheeler, Delbert Amos,	South Ashburnham, Mass.,	A. H. 4.

SPECIAL STUDENTS.

Clark, Nellie Jane,	Plymouth, N. H.,	Mr. Ticknor's.
Downes, Charles Sawyer,	Fracestown, N. H.,	W. H. 2.
Field, Alice Hovey,	Duluth, Minn.,	Prof. Scott's.
Kellogg, Charlotte Melissa,	Hanover, N. H.,	Mr. Kellogg's.
Russell, Edward Elias,	Lebanon, N. H.,	
Smith, Mary Maud,	Plymouth, N. H.,	Mr. Dudley's.
Stewart, Adda Eliza,	Norwich, Vt.,	Mr. Cobb's.
Storrs, May Louise,	Hanover, N. H.,	Mr. Storrs's.
Warden, Frances Louise,	Hanover, N. H.,	Mr. Warden's.
Warden, Lillian Almeda,	Hanover, N. H.,	Mr. Warden's.

† Partial course.

‡ Special course.

SUMMARY, 1890-92.

Class of 1891	4
Class of 1892	5
Class of 1893	10
Class of 1894	16
Class of 1895	11
Class of 1896	5
Special students	10
Total	<u>61</u>

ADMISSION.

Candidates for the first year must present testimonials of good moral character, and must pass an examination in Arithmetic, including the metric system; Algebra, to quadratics; Plane Geometry; Political and Physical Geography; Physiology; American History; and English. Those who pass also an examination in Myers and Allen's Ancient History and Myers's Mediæval and Modern History, can take French in place of the History of the first year.

In English the examination will consist in the criticism of specimens of incorrect English, together with a short essay, correct in spelling, punctuation, division into paragraphs, grammar and expression, on a subject to be announced at the time of the examination. In 1893 the subject will be taken from one of the following books: Shakespeare's Julius Cæsar and Twelfth Night; Scott's Marmion; Longfellow's Courtship of Miles Standish; The Sir Roger de Coverley Papers in the Spectator; Macaulay's second Essay on the Earl of Chatham; Emerson's American Scholar; Irving's Sketch-Book; Scott's Ivanhoe; Dickens's David Copperfield. In 1894, Shakespeare's Julius Cæsar and Merchant of Venice; Scott's Lady of the Lake; Arnold's Sohrab and Rustum; The Sir Roger de Coverley Papers in the Spectator; Macaulay's second Essay on the Earl of Chatham; Emerson's American Scholar; Irving's Sketch Book; Scott's Abbot; Dickens's David Copperfield. In 1895, Shakespeare's Merchant of Venice and Twelfth Night; Milton's L'Allegro, Il Penseroso, Comus and Lycidas; Longfellow's Evangeline; the Sir Roger de Coverley Papers in the Spectator; Macau-

lay's Essay on Milton and Essay on Addison; Webster's first Bunker Hill Oration; Irving's Sketch-Book; Scott's Abbot.

Students are advised to prepare themselves thoroughly in all the required subjects and especially in English, since no college can be expected to admit students who can not write their own language with neatness, clearness, and an approach to accuracy.

They are further recommended not to limit their preparation to these requirements. The excellent academies and high schools of New Hampshire put within their reach, a preliminary training which will add greatly to the value of a college course.

Candidates for advanced standing are also examined in the studies that have been pursued by the class which they propose to enter.

A certificate from any academy or high school will be accepted in place of an examination, upon any subject required for admission to the first year. Every certificate must state the amount of work done by the student, his proficiency, and the text-books used; and in case it is not evident that the student is thoroughly prepared, an examination will be required.

The times for examination are the Monday afternoon and Tuesday before Commencement, and the Tuesday and Wednesday before the beginning of the first term. Candidates will first present themselves with their credentials on the first day of the examination. See Calendar.

Certificate forms will be furnished on application.

Principals who have previously made the necessary request, will be furnished on June 1, with examination papers for admission. If the principal receiving such papers holds an examination on the Tuesday before the Thursday coming on or nearest the seventh of June, and within one week sends the answers to the questions to the Dean, the examination will have the same effect as if held at the College.

DESCRIPTION OF COURSES OF INSTRUCTION.

For the Courses of Study see pages 64-79.

AGRICULTURE.

1. How Crops Grow. *Forty-five exercises.*

This course consists of lectures and recitations upon the composition of plants, the composition and sources of their food, and the processes by which they obtain and assimilate the elements necessary for their growth.

2. Plant Diseases. See Botany.

3. Animal Nutrition. *Thirty exercises.*

This course consists of lectures and recitations upon the physiology of the alimentary organs, the composition of foods, their assimilation, and the composition of the animal body.

4. Principles of Agriculture. *Twenty exercises.*

An exposition of the relations of the natural sciences to Agriculture.

- 5 and 6. Practical Agriculture. *One hundred exercises.*

These two courses form a consecutive series of exercises in which instruction is given by means of practical talks and exercises relative to fertilizers, soils, fruits, vegetables, bees, fowls, and other subjects.

7. Dairying and Dairy Chemistry. *Forty-five exercises.*

Course 7 consists of lectures and recitations upon the composition and manufacture of dairy products, and practical work in the dairy room.

8. Practical Stock Feeding. *Thirty exercises.*

Course 8 is a continuation of Course 3 and consists of lectures upon the compounding of food rations for stock, the action of various foods upon the animal system, and the most approved practice in feeding for the production of milk, butter, live weight, etc. The lectures are accompanied by practical illustrations.

9. Principles of Agriculture.

Twenty exercises.

Course 9 is a continuation of Course 4, and is a further discussion of the relations and applications of the sciences to Agriculture.

10. Agricultural Engineering.

Twenty exercises.

Course 10 consists of instruction in planning and locating drains, roads, and buildings, upon the farm; and discussions on the different forms and uses of agricultural machinery.

11. Stock Breeding. Recitations and lectures.

Twenty exercises.

12. Experimental Agriculture.

Twenty exercises.

Course 12 is the conclusion of Courses 4 and 9, and consists of lectures upon the methods of agricultural research, discussions of problems under investigation by scientists, and observations of experiments in progress upon the College Farm.

13. Discussions of the Bulletins of Experiment Stations.

Thirty-five exercises.

Course 13 consists of weekly discussions and reviews of bulletins with reference to their scientific and practical value.

14. Special Work in Agriculture.

Thirty exercises.

The time given to Course 14 will be used by the student in pursuing original work upon some subject in which he has shown especial ability, and may be chosen by him subject to the approval of the Professor of Agriculture.

CHEMISTRY.

1. Inorganic Chemistry.

Lectures and recitations on general theoretical Chemistry.

Lectures will be illustrated by experiments, charts, specimens, lantern views, etc. Solutions of chemical problems will be required.

2. Inorganic Chemistry.

Course 2 is a continuation of Course 1, but the time will be spent mainly on the metallic elements, their metallurgy, salts, etc.

Open only to students who have passed in Course 1.

3. Organic Chemistry.

Course 3 will consist of lectures and recitations on the chemistry of the carbon compounds together with the study of their properties by means of laboratory practice.

Open to students who have passed in Course 1.

4. Organic Chemistry.

Course 4 is a continuation of Course 3 and must be preceded by it.

5. Qualitative Chemical Analysis.

Course 5 consists of laboratory practice with occasional lectures. The student is expected to become proficient in the separation and detection of the common acids and bases, and to keep a full set of notes. He will have practice in the writing of reactions and will fill out numerous slips containing questions bearing upon his work.

Open only to students who have completed Courses 1 and 2.

6. Qualitative Analysis completed and Quantitative Analysis begun.

The work in quantitative analysis will be, in the main, elementary and preparatory for advanced work. Course extends through two terms.

Open to those who have completed Course 5.

7. Applied or Industrial Chemistry.

Course 7 consists of lectures on chemical manufactures, such as iron, steel, sugar, salt, sodium carbonate, fertilizers, sulphuric acid, glass, matches, paints, dyes, soaps, illuminating gas, petroleum, etc. The lectures will be illustrated by lantern views; and trips to examine important chemical manufactures will be taken to the leading New England cities as far as practicable.

Open only to those who have completed Courses 1, 2, 3, and 4.

8. Quantitative Analysis.

Course 8 consists of special work arranged for those in the Agricultural Course who are limited to the chemistry of the Junior Year. The course consists mainly in the analysis of fertilizers, fodders, grains, milk and other dairy products, etc.

Open to those students who have completed Course 5.

9. Advanced Quantitative Analysis.

Course 9 extends through the year and is intended to fit the student for work in the laboratories of agricultural experiment stations, fertilizer works, iron works, sugar refineries, etc.; and for the duties of the public analyst. The course will be made to fit the end which each has in view and will be largely an individual one. For those students in the Chemical Division of the Agricultural Course the analyses made will tend in the main toward agricultural products, fertilizers, mucks, marls, manures, dairy products, waters, food stuffs, sugars, etc. For the student wishing to enter metallurgical works the analyses will be in the main upon iron, steel, and other metals, ores, limestone, slags, alloys, fuels, etc. As a preparation to the study of medicine, work will be done on

poisons, foods, drugs, urine, etc. Other lines will be arranged to meet the wants of the individual student. Every student will be given some practice in all of the branches of agricultural, metallurgical, medical, sanitary, and industrial chemistry in order to lay a foundation for any future work which may be required of them. A short course in assaying will also be provided. A portion of the time of the last two terms is given to work bearing upon the preparation of a graduating thesis.

Open to students who have completed Course 6.

10. Organic Chemistry.

Course 10 is for students in the Chemical Division of the Agricultural Course and in the Technical Chemistry Course consists of laboratory practice by the students in preparing and purifying products relating to their respective lines of work.

Open to those who have taken Courses 3 and 4.

11. Chemical Journals, Methods, etc.

The work consists in the study of current chemical literature, which is mainly in the German language, with recitations once a week throughout the year. Each student will be expected to prepare abstracts, reports, criticisms, etc., upon assigned articles.

Open to students taking Course 9.

12. Chemical Philosophy ; Lectures and recitations.

Work consists in advanced study of chemical theory. Practical experiments will be performed with the aid of the student in the determination of vapor density, molecular weights, specific heat, etc.; and the study of isomorphism, diffusion of gases, solutions, molecular and atomic volume, etc., will take up much of the time.

Course 12 comes in alternate years with Course 7 and is open to students who have completed Courses 1, 2, 3, and 4.

ZOÖLOGY.

1. Introductory Zoölogy.

A general introduction to the study of animal life, by means of lectures and laboratory dissections of the principal types.

Sixty exercises.

2. Animal Biology.

A general study of the nature and process of animal life, with especial attention to heredity, variation, development, and mental powers.

Forty exercises.

Open to students who have taken Course 1.

3. Entomology.

A review of the classification, structural characters, and biological relations of insects, with a special study of those injurious to cultivated crops and domestic animals, and of the means of preventing their injuries. *Fifty exercises.*

Open only to students who have taken Course 1.

4. Anthropology.

A study of the natural history of man, including his distribution on the earth in ancient and modern times; the various phases of his development toward civilization; his relations to his fellows, etc.

Thirty exercises.

5 A. Systematic Ornithology.

Lectures on the classification of birds with laboratory determinations of species. *Twenty exercises.*

5 B. Economic Ornithology.

Lectures on the relations of birds to agriculture, and their relations to each other and to other organisms. *Twenty exercises.*

Courses 5 A and 5 B are open only to students who have taken Course 1, and if possible Courses 2 and 3.

6. Advanced Zoölogy. *Averaging four exercises a week for a year.*

Course 6 is intended for those students who elect zoology for their Senior Year. It will usually be modified to suit individual needs.

7. Zoölogical Bibliography. *One hour a week for a year.*

Open only to students taking Course 6.

BOTANY.

1. Systematic Botany.

Study of Gray's Lessons and Manual with laboratory determinations, and field work in the preparation of an herbarium. *Fifty exercises.*

2. Structural Botany.

Lectures and laboratory work on the minute structure and physiology of plants. *Forty-five exercises.*

Open only to those who have taken Course 1.

3. Forestry.

Twenty exercises.

Course 3 consists of lectures, with the use of text-book, concerning the utility of forests, principles of silviculture, character and composition of woods and the distribution of timber trees in the United States.

Open only to those who have taken Courses 1 and 2.

4. Plant Diseases.

A study by means of lectures and laboratory work of some of the more important fungous diseases of cultivated plants and the means of preventing their injuries. *Twenty exercises.*

5. Advanced Botany. *Averaging four exercises a week for a year.*

Course 5 is intended for students electing botany for their Senior year, the instruction to be modified by needs of individual students.

Open only to those who have taken all preceding courses.

PHYSICS.

1. Mechanics and Heat.

Forty-five exercises.

2. Electricity and Magnetism.

Thirty exercises.

3. Light and Sound.

Thirty exercises.

Courses 1, 2, and 3 are a general introduction to the subject. The instruction is given by recitations and lectures, the latter being illustrated by experiments and stereopticon. Notes on lectures and experiments are submitted by each student.

4. Laboratory Work in Mechanics and Heat. *Forty-five exercises.*5. Laboratory Work in Heat and Light. *Thirty exercises.*

6. Laboratory Work in Electricity and Magnetism.

Thirty exercises.

Courses 4, 5, and 6 are taken consecutively and are open only to those who have passed in Courses 1, 2, and 3. Students in Engineering must also have passed in Mathematics 1 to 6.

The work consists in the experimental verification of the laws of physics and the determination of physical constants; for example, the student will by experiments, investigate the intensity of gravity, co-efficients of friction, the analytical balance, elasticity of wires, specific heats, laws of radiation and absorption of heat, candle power of lights, dip, declination, and intensity of the earth's magnetism, laws of electric currents, of electro-magnets, etc. A systematic and carefully written report is required on each experiment.

7. Electrical and Photometric Measurements. *Thirty exercises.*

Course 7 is open only to those who have passed in Courses 4, 5, and 6. The work consists in the measurement by various methods of current, resistance and E. M. F., and in photometric study of arc and incandescent lamps.

8. Experimental work on the efficiency, characteristic curves, and curves of potential of dynamos and motors. *Twenty exercises.*

Course 8 is open only to those who have passed in Physics 7 and Engineering 7.

9. Advanced Work in Physical Laboratory.

One hundred and five exercises.

Course 9 is open only to those who have passed in Courses 1 to 6.

10. Astronomy (Young). *Forty exercises.*

GEOLOGY.

1. Elementary Geology. *Forty-five exercises.*

2. Mineralogy.

A short course in blowpipe analysis, followed by laboratory practice in the determination and study of minerals, with special reference to their economic value. *Thirty exercises.*

Course 2 is open only to students who have taken Chemistry 1 and 2.

3. Meteorology.

Recitations and lectures on wind systems, precipitation, humidity, laws of storms and tornadoes, and methods of prediction of atmospheric changes. *Twenty exercises.*

MATHEMATICS.

1. Algebra (Quimby). *Sixty-five exercises.*

2. Solid Geometry with advanced course (Olney). *Fifty-five exercises.*

3. Plane and Spherical Trigonometry (Olney). *Sixty exercises.*

4. Theory of Equations. *Thirty exercises.*

5. Analytic Geometry (Hardy). *Seventy-five exercises.*

6. Differential and Integral Calculus (Hardy). *One hundred exercises.*

ENGINEERING.

1. Surveying (Murray).

Recitations, field work, and plotting, including compass, transit, plane-table, and level work. *Fifty exercises.*

2. Mechanism.

Recitations and exercises in drawing outlines of elementary combinations.

Seventy-five exercises.

Course 2 is open only to those who have taken Drawing 2.

3. Mechanics of Engineering.

One hundred exercises.

A. Dynamics (Statics and Kinetics).

B. Mechanics of Materials.

Course 3 is open only to those who have taken Course 2 and Mathematics 6.

4. Materials of Construction.

Recitations on the production, properties, uses, and preservation of engineering materials.

Sixty exercises.

Course 4 is open only to those who have taken Course 3 B and Chemistry 2.

5. Thermo-Dynamics (Wood).

Seventy-five exercises.

Course 5 is open only to those who have taken Course 3 B and Physics 4 to 6.

6. Heat Motors and Refrigerating Machinery. Recitations.

Thirty exercises.

Course 6 is open only to those who have taken Course 5.

7. Construction and Theory of Dynamos and Electro-motors.

Lectures and quizzes, based on Thompson's Dynamo-Electric Machinery.

Seventy-five exercises.

Course 7 is open only to those who have taken Physics 4 to 6 and Mathematics 5 and 6.

8. Work in Mechanical Laboratory.

A. {
B. { Tests of Materials.

Sixty exercises.

C. Tests of Boilers and Engines.

Twenty exercises.

Course 8 A and B is open only to those who have taken Course 3 B. Course 8 C is open only to those who have taken Course 5.

9. Machine Design. Recitations.

Forty exercises.

Course 9 is open only to those who have taken Courses 3 and 4.

10. Dynamo Design.

Work in the drawing room in the elementary designing of dynamos and electro-motors.

Forty exercises.

Course 10 is open to those who have taken Course 7.

11. Electrical Installations.

Lectures and quizzes on the methods and systems of electric lighting and electric distribution of power. *Thirty exercises.*

Course 11 is open only to those who have taken Course 7.

12. Sanitary Engineering.

Lectures on heating, ventilation, drainage, and plumbing of public and private buildings. *Ten exercises.*

13. Roads, Streets, and Pavements.

Recitations and lectures on construction and maintenance of paved, macadamized, and gravel roads with discussion of laws relating thereto, *Twenty exercises.*

DRAWING.

Two hours and one half in the drawing room is reckoned as one exercise.

1. Freehand Drawing.

A. Copy Work and Sketching. *Thirty exercises.*

B. Shading and Tinting, followed by a short course on the care and use of drawing instruments. *Twenty exercises.*

2. Descriptive Geometry and Drawing. Solution of problems in descriptive geometry. *Eighty exercises.*

Course 2 is open only to those who have taken Mathematics 2.

3. Mechanical Drawing.

A. Elementary Projection Drawing. *Twenty exercises.*

B. Perspective Drawing and Line Shading. *Twenty exercises.*

C. Workshop Drawings. Tracing and the blue process of copying drawings. *Thirty exercises.*

SHOP WORK.

Three hours' work in the shops is considered equivalent to one exercise.

1. Work in Wood Shop. Exercises in carpentry, joinery, and pattern making.

A. *Forty-five exercises.*

B. *Thirty exercises.*

C. *Forty-five exercises.*

D. *Thirty exercises.*

2. Work in Machine Shop.

Exercises in bench work, machine work, and shop measurements.

A. *Thirty exercises.*

B. *Twenty exercises.*

C. *Twenty exercises.*

D. *Forty-five exercises.*

E. *Thirty exercises.*

F. *Thirty exercises.*

ENGLISH.

1. Rhetoric (A. S. Hill). Eight themes with other exercises.
Seventy exercises.
2. Three Themes, one each term.
3. Three Original Declamations, one each term.
4. Three Original Declamations, one each term.
5. English Literature, Chaucer to Bacon (Taine). Study of authors.
Twenty exercises.
6. English Literature, Milton to Wordsworth (Taine). Study of authors.
Forty-five exercises.
7. English Literature, Victorian writers.
Thirty exercises.
8. American Literature. Lectures and study of authors.
Thirty or fifty exercises.

FRENCH.

1. French Grammar (Edgren).
Forty-five exercises.
 2. French Reader (Super).
Thirty exercises.
 3. Lectures Courantes des Ecoliers Francais (Caumont).
Thirty exercises.
 4. Chimie Agricole (Pierre).
Forty-five exercises.
 5. Scientific French.
Sixty exercises.
- Each course in French is open only to students who have completed the preceding course.*

GERMAN.

1. German Grammar (Collar-Eysenbach).
Forty-five exercises.
 2. German Reader (Joynes).
Thirty exercises.
 3. Schiller's Jungfrau von Orléans.
Thirty exercises.
 4. Scientific German.
One hundred and five exercises.
- Each course in German is open only to students who have completed the previous course.*

POLITICAL SCIENCE.

1. Political Economy (Walker). Lectures. *Fifty exercises.*
 2. Laws of Business (Parsons). Lectures. *Thirty-three exercises.*
 3. Constitutional Law (Pomeroy). *Forty exercises.*
 4. Advanced Political Economy. *Thirty exercises.*
- Course 4 is open only to those who have taken Course 1.*

HISTORY.

1. Ancient History (Myers and Allen). *Forty-five exercises.*
2. Mediæval History (Myers). *Thirty exercises.*
3. Modern History (Myers). *Thirty exercises.*
4. American Political History. *Forty-five exercises.*

COURSES OF STUDY.

For details see Description of Courses of Instruction.

COURSE IN AGRICULTURE.

This course is designed to give young men a thorough knowledge of practical Agriculture and the sciences having a direct bearing upon it, without neglecting the broad principles of a general education. For the first two years these three divisions of this course are the same with the exception that in the Chemical and Biological Divisions, French is required in the second years.

The strictly agricultural work of the last two years is planned to give valuable knowledge for future use on the farm or in the dairy.

The Chemical and Biological Divisions are designed to give professional training in these two sciences which have such a close connection with, and influence upon modern Agriculture.

FRESHMAN YEAR.

FIRST TERM.

	Hours per week.
Rhetoric and Themes (English 1)	2
Algebra and Geometry (Mathematics 1 and 2)	6
Joinery (Shop Work 1 A)	3
Freehand Drawing (Drawing 1 A)	2
Ancient History (History 1) ; or French* (French 1)	3

SECOND TERM.

Rhetoric and Themes (English 1)	2
Geometry and Trigonometry (Mathematics 2 and 3)	6
Shop Work (Shop Work 1 B)	3
Freehand Drawing (Drawing 1 B)	2
Mediaeval History (History 2) ; or French* (French 2)	3

* French can be elected by those who have taken History 1, 2, and 3.

THIRD TERM.

	Hours per week.
Rhetoric and Themes (English 1)	2
Trigonometry (Mathematics 3)	3
Shop Work (Shop Work 1 C)	3
Botany (Botany 1)	5
Modern History (History 3); or French (French 3)	3

SOPHOMORE YEAR.

FIRST TERM.

Zoölogy (Zoölogy 1)	4
Inorganic Chemistry (Chemistry 1)	3
Structural Botany (Botany 2)	3
Physics (Physics 1)	3
French* (French 1 or 4); or Shop Work (Shop Work 2 A)	3
One Theme (English 2).	

SECOND TERM.

Inorganic and Organic Chemistry (Chemistry 2 and 3)	6
Physics (Physics 2)	3
English Literature (English 5)	2
Mechanical Drawing (Drawing 3 A)	2
French (French 2 or 5); or Shop Work (Shop Work 2 B)	3
One Theme (English 2).	

THIRD TERM.

Organic Chemistry (Chemistry 4)	2
Mineralogy (Geology 2)	3
Surveying (Engineering 1)	5
Physics (Physics 3)	3
French (French 3 or 5); or American Literature (English 8)	3
One Theme (English 2).	

JUNIOR YEAR.

FIRST TERM.

How Crops Grow (Agriculture 1)	3
Plant Diseases (Botany 4)	2
Chemistry (Chemistry 5)	5

*French is required of those students who intend to take the work of the Chemical and Biological Divisions.

	Hours per week.
English Literature (English 6)	3
German (German 1); or Physical Laboratory (Physics 4).	3
One Original Declamation (English 3).	

SECOND TERM.

Animal Nutrition (Agriculture 3)	3
Geology and Meteorology (Geology 1 and 3)	5
Agricultural Chemistry (Chemistry 8)	3
Applied Agriculture (Agriculture 4)	2
German (German 2); or Zoölogy (Zoölogy 2)	3
One Original Declamation (English 3).	

THIRD TERM.

Entomology (Zoölogy 3)	5
Forestry (Botany 3)	2
Practical Agriculture (Agriculture 5)	4
Roads (Engineering 13)	2
German (German 3); or Chemistry (Chemistry 6)	3
One Original Declamation (English 3).	

SENIOR YEAR.

FIRST TERM.

Laws of Business and Constitutional Law (Political Science 2 and 3)	5
Dairying and Dairy Chemistry (Agriculture 7)	3
Practical Agriculture (Agriculture 6)	4
Discussion of Experiment Station Bulletins (Agriculture 13)	1
German (German 4); or Political History (History 4)	3
One Original Declamation (English 4).	

SECOND TERM.

Astronomy (Physics 10) and Sanitary Science (Engineering 12)	5
Stock Feeding (Agriculture 8)	3
Applied Agriculture (Agriculture 9)	2
Economic Ornithology (Zoölogy 5 B)	2
Discussion of Experiment Station Bulletins (Agriculture 13)	1
German (German 4); or Zoölogy (Zoölogy 6)	3
One Original Declamation (English 4).	

THIRD TERM.

	Hours per week.
Political Economy (Political Science 1)	5
Agricultural Engineering (Agriculture 10)	2
Stock Breeding and Experimental Agriculture (Agriculture 11 and 12)	4
Discussion of Experiment Station Bulletins (Agriculture 13) . .	1
German (German 4) ; or Special Work (Agriculture 14)	3
One Original Declamation (English 4).	

CHEMICAL DIVISION OF THE AGRICULTURAL COURSE.

The work in this division is intended especially to fit for the profession of an agricultural chemist—for work in experiment stations, large dairy establishments, fertilizer works, etc. This field offers perhaps more inducements for investigation in chemical science than any other. The chemistry of plant or animal growth and nutrition is comparatively undeveloped, and offers a wide and profitable field for research.

JUNIOR YEAR.

FIRST TERM.

How Crops Grow (Agriculture 1)	3
German (German 1)	3
Plant Diseases (Botany 4)	2
English Literature (English 6)	3
Chemistry (Chemistry 5)	5
One Original Declamation (English 3).	

SECOND TERM.

Animal Nutrition (Agriculture 3)	3
German (German 2)	3
Geology (Geology 1)	3
Chemistry (Chemistry 6)	5
Applied Chemistry (Chemistry 7)	2
One Original Declamation (English 3).	

THIRD TERM.

Entomology (Zoölogy 3)	5
German (German 3)	3
Chemistry (Chemistry 6)	5
Applied Chemistry (Chemistry 7)	2
One Original Declamation (English 3).	

SENIOR YEAR.

FIRST TERM.

	Hours per week.
Constitutional Law and Laws of Business (Political Science 2 and 3)	5
German (German 4)	3
Chemistry (Chemistry 9)	5
Organic Chemistry (Chemistry 10)	2
Chemical Journals, Methods, etc. (Chemistry 11)	1
One Original Declamation (English 4).	

SECOND TERM.

Astronomy (Physics 10)	4
Sanitary Engineering (Engineering 12)	1
German (German 4)	3
Chemistry (Chemistry 9)	5
Chemical Philosophy (Chemistry 12)	2
Chemical Journals, Methods, etc. (Chemistry 11)	1
One Original Declamation (English 4).	

THIRD TERM.

Political Economy (Political Science 1)	5
German (German 4)	3
Chemistry (Chemistry 9)	5
Chemical Philosophy (Chemistry 12)	2
Chemical Journals, Methods, etc. (Chemistry 11)	1
One Original Declamation (English 4).	

BIOLOGICAL DIVISION OF THE AGRICULTURAL
COURSE.

Students desiring to make a special study of the biological sciences relating to Agriculture—such as botany, entomology, economic zoology, etc.—may elect the following schedule for their last two years.

JUNIOR YEAR.

FIRST TERM.

How Crops Grow (Agriculture 1)	3
German (German 1)	3
Chemistry (Chemistry 5)	4
Plant Diseases (Botany 4)	2
English Literature (English 6)	3
One Original Declamation (English 3).	

SECOND TERM.

	Hours per week.
Animal Nutrition (Agriculture 3)	3
Geology (Geology 1)	3
German (German 2)	3
Chemistry (Chemistry 6)	3
Animal Biology (Zoölogy 2)	4
One Original Declamation (English 3).	

THIRD TERM.

Entomology (Zoölogy 3)	5
German (German 3)	3
Anthropology (Zoölogy 4)	3
Agriculture (Agriculture 5)	3
Forestry (Botany 3)	2
One Original Declamation (English 3).	

SENIOR YEAR.

FIRST TERM.

Laws of Business and Constitutional Law (Political Science 2 and 3)	5
German (German 4)	3
Meteorology (Geology 3)	2
Botany (Botany 5) ; or Zoölogy (Zoölogy 6 and 7)	6
One Original Declamation (English 4).	

SECOND TERM.

Astronomy (Physics 10)	4
Sanitary Science (Engineering 12)	1
German (German 4)	3
Ornithology (Zoölogy 5)	4
Botany (Botany 5) ; or Zoölogy (Zoölogy 6 and 7)	4
One Original Declamation (English 4).	

THIRD TERM.

Political Economy (Political Science 1)	5
German (German 4)	3
American Literature (English 8)	3
Botany (Botany 5) ; or Zoölogy (Zoölogy 6 and 7)	5
One Original Declamation (English 4).	

COURSE IN TECHNICAL CHEMISTRY.

This course is designed to meet the needs of the general professional chemist. Those desiring to give their chief time to agricultural chemical research and analysis are advised to take the Agricultural Course, giving their last two years to the Chemical Division of that course.

FRESHMAN YEAR.

FIRST TERM.

	Hours per week.
Rhetoric and Themes (English 1)	2
History (History 1) ; or French * (French 1)	3
Mathematics (Mathematics 1 and 2)	6
Drawing (Drawing 1 A)	2
Shop Work (Shop Work 1 A)	3

SECOND TERM.

Rhetoric and Themes (English 1)	2
History (History 2) ; or French * (French 2)	3
Mathematics (Mathematics 2 and 3)	6
Drawing (Drawing 1 B)	2
Shop Work (Shop Work 1 B)	3

THIRD TERM.

Rhetoric and Themes (English 1)	2
History (History 3) ; or French * (French 3)	3
Mathematics (Mathematics 3)	3
Botany (Botany 1)	5
Shop Work (Shop Work 1 B)	3

SOPHOMORE YEAR.

FIRST TERM.

Analytical Geometry (Mathematics 5) ; or Zoölogy (Zoölogy 1) 5 or 4	
Inorganic Chemistry (Chemistry 1)	3
French (French 1 or 4)	3
Physics (Physics 1)	3
Structural Botany (Botany 2)	3
One Theme (English 2).	

* French is taken by those who have passed in History 1, 2, and 3.

SECOND TERM.

	Hours per week.
Inorganic Chemistry (Chemistry 2)	3
French (French 2 or 5)	3
Organic Chemistry (Chemistry 3)	3
Physics (Physics 2)	3
English Literature (English 5)	2
Drawing (Drawing 3 A)	2
One Theme (English 2).	

THIRD TERM.

Mineralogy (Geology 2)	3
French (French 3 or 5)	3
Organic Chemistry (Chemistry 4)	2
Physics (Physics 3)	3
Surveying (Engineering 1)	5
One Theme (English 2).	

JUNIOR YEAR.

FIRST TERM.

Chemistry (Chemistry 5)	5
German (German 1)	3
Physical Laboratory (Physics 4)	3
How Crops Grow (Agriculture 1) ; or English Literature (English 6)	3
Plant Diseases (Botany 4)	2
One Original Declamation (English 3).	

SECOND TERM.

Chemistry (Chemistry 6)	5
German (German 2)	3
Physical Laboratory (Physics 5)	3
Geology (Geology 1)	3
Applied Chemistry (Chemistry 7)	2
One Original Declamation (English 3).	

THIRD TERM.

Chemistry (Chemistry 6)	5
German (German 3)	3
Physical Laboratory (Physics 6)	3
Applied Chemistry (Chemistry 7)	2
Machine Shop (Work Shop 2 C)	2
One Original Declamation (English 3).	

SENIOR YEAR.

FIRST TERM.

	Hours per week.
Chemistry (Chemistry 9)	5
Organic Chemistry (Chemistry 10)	2
German (German 4)	3
Constitutional Law and Laws of Business (Political Science 2 and 3)	5
Chemical Journals, Methods, etc. (Chemistry 11)	1
One Original Declamation (English 4).	

SECOND TERM.

Chemistry (Chemistry 9)	5
German (German 4)	3
Astronomy (Physics 10)	4
Sanitary Engineering (Engineering 12)	1
Chemical Philosophy (Chemistry 12)	2
Chemical Journals, Methods, etc. (Chemistry 11)	1
One Original Declamation (English 4).	

THIRD TERM.

Chemistry (Chemistry 9)	5
German (German 4)	3
Political Economy (Political Science 1)	5
Chemical Philosophy (Chemistry 12)	2
Chemical Journals, Methods, etc. (Chemistry 11)	1
One Original Declamation (English 4).	

COURSE IN MECHANICAL ENGINEERING.

FRESHMAN YEAR.

FIRST TERM.

Rhetoric and Themes (English 1)	2
Ancient History (History 1) ; or French *(French 1)	3
Algebra and Geometry (Mathematics 1 and 2)	6
Freehand Drawing (Drawing 1A)	2
Shop Work (Shop Work 1 A)	3

*French is taken by those who have passed in History 1, 2, and 3.

SECOND TERM.

	Hours per week.
Rhetoric and Themes (English 1)	2
Mediaeval History (History 2); or French *(French 2)	3
Geometry and Trigonometry (Mathematics 2 and 3)	6
Drawing (Drawing 1 B)	2
Shop Work (Shop Work 1 B)	3

THIRD TERM.

Rhetoric and Themes (English 1)	2
Modern History (History 3); or French *(French 3)	3
Trigonometry and Theory of Equations (Mathematics 3 and 4)	6
Descriptive Geometry (Drawing 2)	5

SOPHOMORE YEAR.

FIRST TERM.

Analytic Geometry (Mathematics 5)	5
French* (French 1 or 4); or German *(German 1)	3
Physics (Physics 1)	3
Descriptive Geometry (Drawing 2)	2
Shop Work (Shop Work 1 C)	3
One Theme (English 2).	

SECOND TERM.

Calculus (Mathematics 6)	5
French* (French 2 or 5); or German* (German 2)	3
Physics (Physics 2)	3
Drawing (Drawing 3 B)	2
Shop Work (Shop Work 1 D)	3
One Theme (English 2).	

THIRD TERM.

Calculus (Mathematics 6)	5
French* (French 3 or 5); or German* (German 3)	3
Physics (Physics 3)	3
Surveying (Engineering 1)	5
One Theme (English 2).	

* French is taken in Freshman Year by those who have passed in History 1, 2, and 3. Engineering students who take French in Freshman Year, take German in the two following years. Engineering students who take History in Freshman Year may elect between two years of French and two years of German.

JUNIOR YEAR.

FIRST TERM.

Hours per week.

Mechanism (Engineering 2)	.	.	.	.	.	.	.	5
French (French 4;) or German (German 4)	.	.	.	.	.	.	.	3
Chemistry (Chemistry 1)	.	.	.	.	.	.	.	3
Physical Laboratory (Physics 4)	.	.	.	.	.	.	.	3
Shop Work (Shop Work 2 A)	.	.	.	.	.	.	.	2
One Original Declamation (English 3).								

SECOND TERM.

Mechanics of Engineering (Engineering 3 A)	.	.	.	.	.	.	.	5
French (French 5); or German (German 4)	.	.	.	.	.	.	.	3
Chemistry (Chemistry 2)	.	.	.	.	.	.	.	3
Physical Laboratory (Physics 5)	.	.	.	.	.	.	.	3
Shop Work (Shop Work 2 B)	.	.	.	.	.	.	.	2
One Original Declamation (English 3).								

THIRD TERM.

Mechanics of Engineering (Engineering 3 B)	.	.	.	.	.	.	.	5
French (French 5); or German (German 4)	.	.	.	.	.	.	.	3
Mineralogy (Geology 2)	.	.	.	.	.	.	.	3
Physical Laboratory (Physics 6)	.	.	.	.	.	.	.	3
Shop Work (Shop Work 2 C)	.	.	.	.	.	.	.	2
One Original Declamation (English 3).								

SENIOR YEAR.

FIRST TERM.

Materials of Construction (Engineering 4)	.	.	.	.	.	.	.	4
Thermo-Dynamics (Engineering 5)	.	.	.	.	.	.	.	3
Chemistry (Chemistry 5)	.	.	.	.	.	.	.	2
Drawing (Drawing 3 C)	.	.	.	.	.	.	.	2
Shop Work (Shop Work 2 D)	.	.	.	.	.	.	.	3
Mechanical Laboratory (Engineering 8 A)	.	.	.	.	.	.	.	2
One Original Declamation (English 4).								

SECOND TERM.

Thermo-Dynamics (Engineering 5)	.	.	.	.	.	.	.	3
Chemistry (Chemistry 6)	.	.	.	.	.	.	.	2
Mechanical Laboratory (Engineering 8 B)	.	.	.	.	.	.	.	3

	Hours per week.
Machine Design (Engineering 9)	4
Shop Work (Shop Work 2 E)	3
Work on Thesis	1
One Original Declamation (English 4).	

THIRD TERM.

Political Economy (Political Science 1)	5
Heat Motors and Refrigerating Machines (Engineering 6)	3
Mechanical Laboratory (Engineering 8 C)	2
Shop Work (Shop Work 2 F)	3
Work on Thesis	3
One Original Declamation (English 4).	

COURSE IN ELECTRICAL ENGINEERING.

For three years the course is the same as the course in Mechanical Engineering. The work of the fourth year is almost entirely technical. Recitations and lectures are supplemented by work in the laboratories, or by the inspection and study of machinery in operation.

For the latter purpose the electric lighting and electric street railway systems in operation within ten miles of the College furnish excellent opportunities. Even more valuable will be a small but first-class central station on the alternating system operated by the College itself, which the student will be enabled to study and test.

SENIOR YEAR.

FIRST TERM.

Materials of Construction (Engineering 4)	4
Thermo-Dynamics (Engineering 5)	3
Chemistry (Chemistry 5)	2
Drawing (Drawing 3 C)	2
Dynamo-Electric Machinery (Engineering 7)	5
One Original Declamation (English 4).	

SECOND TERM.

Thermo-Dynamics (Engineering 5)	3
Chemistry (Chemistry 6)	2
Mechanical Laboratory (Physics 8 B)	3
Dynamo Design (Engineering 10)	4
Electrical Laboratory (Physics 7)	3
Work on Thesis.	1
One Original Declamation (English 4).	

THIRD TERM.

	Hours per week.
Political Economy (Political Science 1)	5
Heat Motors (Engineering 6)	3
Electrical Laboratory (Physics 8)	2
Electrical Installation (Engineering 11)	3
Work on Thesis	3
One Original Declamation (English 4).	

GENERAL COURSE.

FRESHMAN YEAR.

FIRST TERM.

Rhetoric and Themes (English 1)	2
Ancient History (History 1); or French * (French 1)	3
Algebra and Geometry (Mathematics 1 and 2)	6
Freehand Drawing (Drawing 1 A)	2
Shop Work * (Shop Work 1 A)	3

SECOND TERM.

Rhetoric and Themes (English 1)	2
Mediaeval History (History 2); or French * (French 2)	3
Geometry and Trigonometry (Mathematics 2 and 3)	6
Drawing (Drawing 1 B)	2
Shop Work * (Shop Work 1 B)	3

THIRD TERM.

Rhetoric and Themes (English 1)	2
Modern History (History 3); or French * (French 3)	3
Trigonometry (Mathematics 3, completed)	3
Botany (Botany 1)	5
Shop Work * (Shop Work 1 C)	3

SOPHOMORE YEAR.

FIRST TERM.

Zoölogy (Zoölogy 1)	4
French (French 1 or 4)	3
Mechanics and Heat (Physics 1)	3

* French is taken in Freshman Year by those who have passed the examinations in History 1, 2, and 3, and by women as an equivalent for Shop Work.

Hours per week.

Chemistry (Chemistry 1)	3
Structural Botany (Botany 2)	3
One Theme (English 2).	

SECOND TERM.

French (French 2 or 5)	3
Physics (Physics 2)	3
Chemistry (Chemistry 2 and 3)	6
Mechanical Drawing (Drawing 3 A)	2
English Literature (English 5)	2
One Theme (English 2).	

THIRD TERM.

French (French 3 or 5)	3
Mineralogy (Geology 2)	3
Physics (Physics 3)	3
Organic Chemistry (Chemistry 4)	2
Surveying (Engineering 1)	5
One Theme (English 2).	

Women can substitute for surveying, one of the elective studies from the third term of the Junior Year.

JUNIOR YEAR.

FIRST TERM.

German (German 1)	3
English Literature (English 6)	3
Laboratory Work in Chemistry (Chemistry 5)	5
One Original Declamation (English 3).	

Elective, five hours per week from the following:

How Crops Grow (Agriculture 1)	3
Plant Diseases (Botany 4)	2
Laboratory Work in Physics (Physics 4)	3
Analytic Geometry (Mathematics 5)	5

SECOND TERM.

German (German 2)	3
English Literature (English 7)	3
One Original Declamation (English 3).	

Elective, ten hours per week from the following:

	Hours per week.
Animal Nutrition (Agriculture 3)	3
Geology (Geology 1)	3
Laboratory Work in Chemistry (Chemistry 6)	3 to 5
Laboratory Work in Physics (Physics 5)	3
Animal Biology (Zoölogy 2)	4
Calculus (Mathematics 6)	5

THIRD TERM.

German (German 3)	3
Political Economy (Political Science 1)	5
One Original Declamation (English 3).	

Elective, eight hours per week from the following:

Entomology (Zoölogy 3)	5
Anthropology (Zoölogy 4)	3
Laboratory Work in Chemistry (Chemistry 6)	3 or 5
Laboratory Work in Physics (Physics 6)	3
Calculus (Mathematics 6)	5

SENIOR YEAR.

FIRST TERM.

Constitutional Law and Laws of Business (Political Science 2 and 3)	5
German (German 4)	3
One Original Declamation (English 4).	

Elective, eight hours per week from the following:

American Political History (History 4)	3
Advanced Work in Physical Laboratory (Physics 9)	3
Laboratory Work in Chemistry (Chemistry 9)	3 to 5
Advanced Botany (Botany 5)	4
Advanced Zoölogy (Zoölogy 6 and 7)	4 or 5

SECOND TERM.

Astronomy and Sanitary Science (Physics 10 and Engineering 12)	5
German (German 4)	3
One Original Declamation (English 4).	

Elective, eight hours per week from the following:

Advanced Political Economy (Political Science 4)	3
Advanced Work in Physical Laboratory (Physics 9)	3
Laboratory Work in Chemistry (Chemistry 9)	3 or 5

	Hours per week.
Advanced Botany (Botany 5)	4
Advanced Zoölogy (Zoölogy 6 and 7)	4 or 5
Meteorology (Geology 3)	2
Ornithology (Zoölogy 5 A)	2

THIRD TERM.

American Literature (English 8)	5
German (German 4)	3
Work on Thesis.	
One Original Declamation (English 4).	

Elective, three to five exercises from the following :

Advanced Work in Physical Laboratory (Physics 9)	3
Laboratory Work in Chemistry (Chemistry 9)	3 or 5
Advanced Botany (Botany 5)	4
Advanced Zoölogy (Zoölogy 6 and 7)	4 or 5
Roads (Engineering 13)	2
Forestry (Botany 3)	2

ATTENDANCE.

All students are required to attend sixteen exercises a week. This number does not include the weekly rhetorical exercise.

PRIZES.

I. THE SMYTH PRIZES. — Hon. Frederick Smyth, of Manchester, N. H., offers two prizes in the Senior and Junior classes, one of twenty and the other of ten dollars, for the best essays on subjects connected with agriculture or the mechanic arts; also three prizes, one of twenty, one of fifteen, and one of ten dollars, for excellence in oratory, open to the upper classes; also two prizes, one of fifteen and one of ten dollars, to the lower classes for reading.

II. JESUP PRIZES. — Professor Jesup offers to the class in botany two prizes, amounting to twenty dollars, for the two best herbariums.

III. BAILEY PRIZE.—Dr. C. H. Bailey, of Gardner, Mass., and E. A. Bailey, B. S., of Winchendon, Mass., offer a prize of ten dollars for proficiency in chemistry.

IV. ERSKINE MASON PRIZE. — Mrs. Catharine M. Mason, of Stamford, Conn., has invested one hundred dollars as a memorial of her son, a member of the class of '93, the income from which is to be given, for the present, to that member of the Senior class who has made the greatest improvement during his course.

DEGREE.

The Degree of Bachelor of Science will be conferred upon those who complete the entire course and pass the final examinations. Each candidate for a degree must prepare a thesis on some subject relating to the course of study taken.

BUILDINGS.

MAIN BUILDING.

The main building has a length of 128 feet, exclusive of the porte cochère, which is 40 feet in length, and a width of 93 feet in the widest part. It is built of granite and brick and has three stories besides the basement.

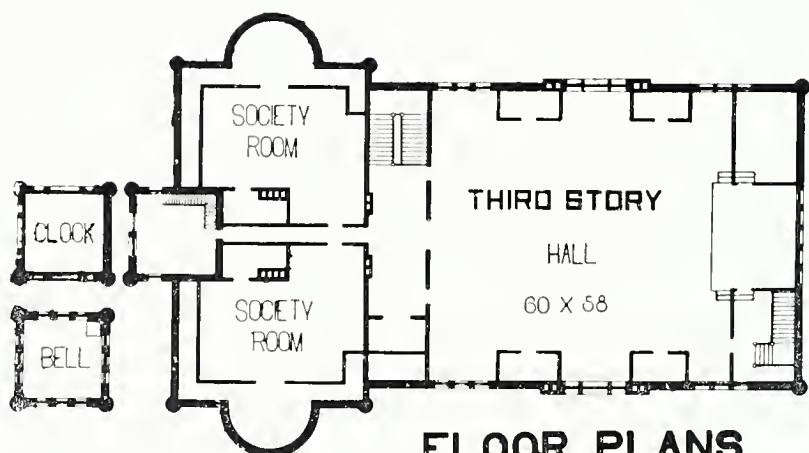
One half of the first floor and basement is given to the library, which is provided with a large, well lighted reading room for papers and magazines, a reference room for special work, a librarian's room, a delivery room, and shelf space for fifty thousand volumes.

The remainder of the first floor is used for an office, a waiting room for women, and recitation rooms.

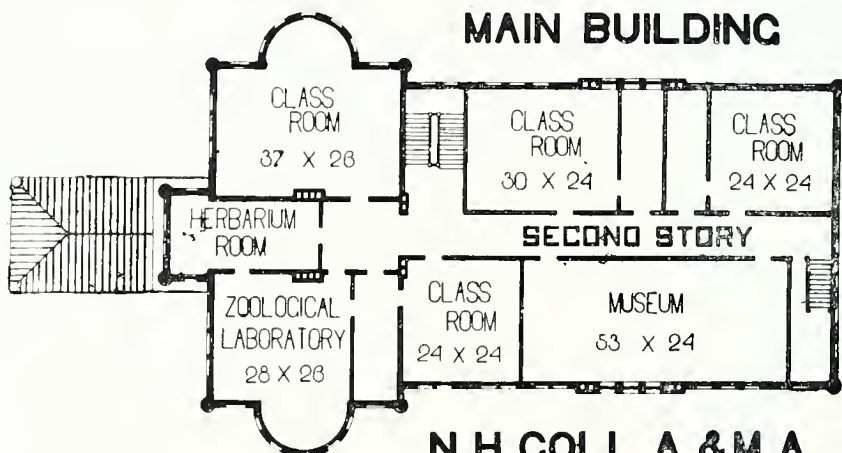
On the second floor are other recitation rooms, the botanical and zoölogical laboratories, and the museum.

On the third floor are several rooms, including a large hall.

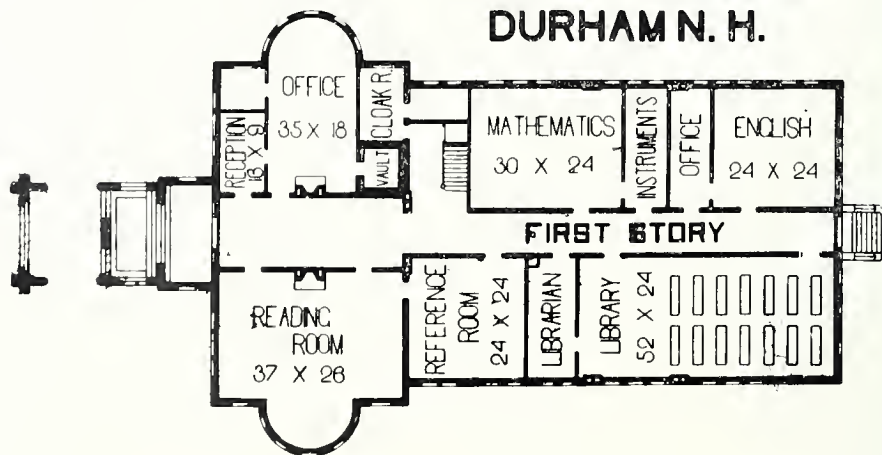
The building is lighted by gas and electricity and provided with the most approved system of heating and ventilation.



FLOOR PLANS MAIN BUILDING



N. H. COLL. A. & M. A. DURHAM N. H.



SCIENCE BUILDING.

The science building contains the laboratories and lecture rooms for instruction in chemistry, physics, and electrical engineering. It is a substantial brick building, 92 by 70 feet, and three stories high including the basement. It is heated by steam brought from the shops, is lighted by gas and electricity, and is provided with a system of thorough ventilation. Water, gas, high pressure steam, hydrogen, oxygen, vacuum, and blast are to be supplied through pipes wherever needed, and the lecture rooms in addition will have switches controlling both dynamo and battery currents, and arrangements for stereopticon illustration.

The basement will contain a small work shop, the photometer, photographic and comparator rooms, a clock room protected by double walls against changes of temperature, and an assay laboratory which is fire-proof and provided with the necessary fixtures.

The first floor contains the mineralogical laboratory which is provided with tile covered desks and other facilities for blowpipe analysis; the junior physical laboratory; an apparatus room; a reading and reference room for physical and electrical books and periodicals; an electrical laboratory, from the neighborhood of which masses of iron have been excluded so that magnetic measurements can be made with a good degree of accuracy; and the physical lecture room which is provided with all necessary conveniencies as before mentioned. For optical experiments the room can be darkened by means of special window shutters operated from one of the lecture desks. A stone pier between the two desks makes it possible to use delicate instruments.

The second floor is given entirely to chemical work; and contains store rooms, an organic laboratory, a qualitative laboratory, a private laboratory, a dark room for polariscopic and spectroscopic work, a lecture room provided with facilities as before described, a quantitative laboratory, and a room to contain the delicate chemical balances and most important reference works.

The laboratories are to be fitted out with the most modern accessories and with special reference to the kind of work to be performed in each.

THE SHOP BUILDINGS.

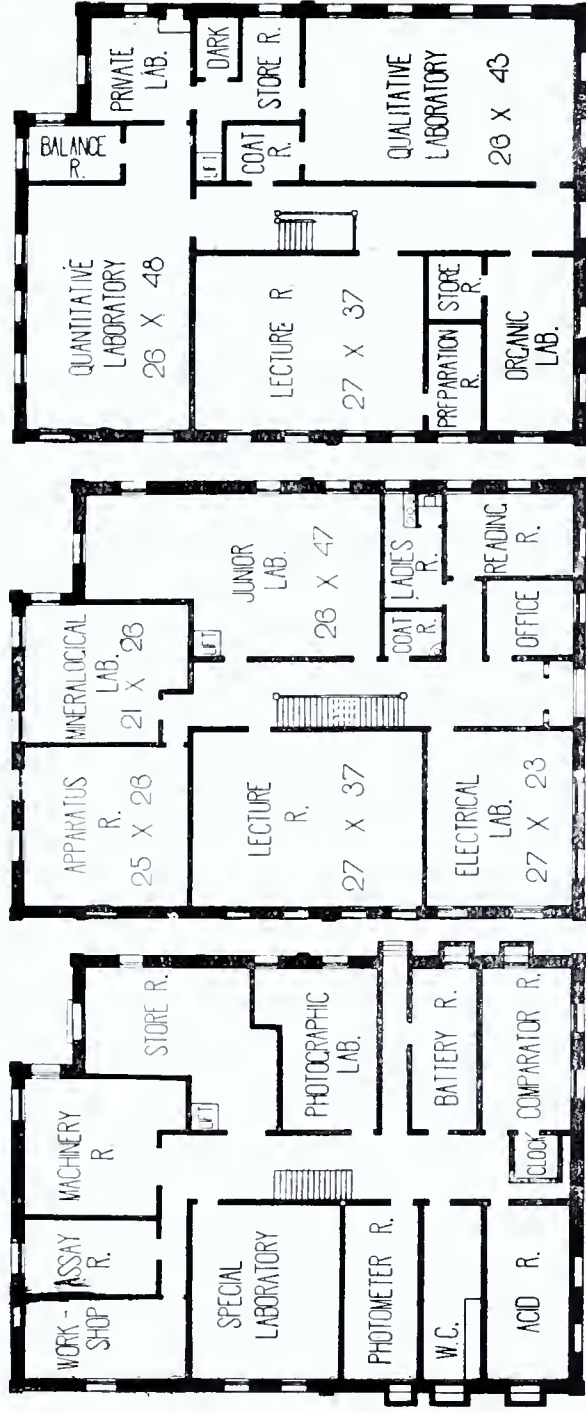
The shops have been planned and built with the object of providing facilities for instruction in the working of wood and metals and in the design, construction, care, and management of machinery. Incorporated with the shops is a central station for furnishing heat, light, water, and power, wherever needed in any of the college buildings; and the machinery of this station will form a part of the material equipment of the engineering departments.

The main shop building is 42 by 106 feet, and two stories high, with a basement 31 by 42 feet. In a separate one-story building 40 by 100 feet, on a level with the basement of the main building, are the boiler house, forge shop, coal shed, and foundry.

In the boiler room, three boilers, aggregating one hundred and sixty horse power, will furnish steam for heating and power to all the college buildings, being conducted wherever needed through underground mains. A brick chimney 95 feet high has been built to carry away the waste gases from the boilers and forges. In the forge room, students may obtain instruction and practice in forging, welding, and in hardening and tempering steel, as well as in the less common operations of the blacksmith's trade. In the foundry the equipment will provide for exercises in making dry and green sand moulds and in melting and pouring iron and brass, and other metals and alloys. The coal room provides for the storage of two hundred tons of coal, conveniently near the boilers and the forges.

The basement of the main shop building is intended for an engine room, to contain a forty horse-power engine, furnishing power for the shops and for the electric lighting; a dynamo for lighting the college buildings and campus; and the large steam pump, receiving water by gravity from the reservoir one half

FLOOR PLANS SCIENCE BUILDING



BASEMENT

FIRST STORY

SECOND STORY

N.H. COLL. A. & M. A. DURHAM N. H.

mile distant and forcing it through underground mains to the various hydrants and buildings. The engine room will serve as a power laboratory, and the machines mentioned, with others, will give to students opportunity for making efficiency tests.

On the first floor of the main shop building, a lavatory is provided, with lockers for the convenience of students. The largest room on this floor is the machine shop, where there will be opportunity for practice in the operations of working metals by cutting tools, both by hand work and by machinery. In the mechanical laboratory, the student may learn by actual tests the strength and other properties of the various materials used in engineering constructions; the lubricating value of oils, etc.

The second floor of this building is mainly occupied by a wood shop, in which the common branches of carpentry, joinery, and pattern making will be taught. Practice will be given in the use of carpenter's tools, and in the care and operation of the machines of most general use in wood-working. A well lighted corner of this room is partitioned off and will be equipped for copying drawings by the blue process. Two office rooms are also provided, one of which will be temporarily used as a recitation room, the other as a drawing room.

The shop buildings are constructed on the "slow-burning" principle, with thick walls, and heavy continuous plank floors. The rooms are all well lighted and well ventilated.

NESMITH HALL.

Nesmith Hall, a handsome brick building, two stories in height, is used for the work of the Agricultural Experiment Station. It contains offices and working rooms, a reference library, a chemical laboratory, a bacteriological and microscopical laboratory, and an agricultural museum.

APPARATUS, LIBRARY, AND FARM.

The various chemical laboratories are to be supplied with a full line of such apparatus as is required in each. Besides all necessary glass and porcelain ware this will include water

baths; drying ovens, combustion, muffle, and assay furnaces; platinum dishes and crucibles; polariscope; spectroscope; balances; lantern and other lecture appliances; etc.

The laboratory for instruction in physics and in electrical engineering is being equipped with the best apparatus to be obtained. In general physics the apparatus will include a standard clock, a photometer, standard of lengths, etc., and a good collection of the usual apparatus for physical laboratory work and lecture room illustration, to which will be continually added pieces purchased or made in the college shop.

In electricity and magnetism the outfit will include a Thomson ampere balance, a standard Wheatstone's bridge, an Elliott microfarad condenser, four Carhart-Clark standard cells, Deprez-D'Arsonval, standard tangent, and astatic galvanometers, besides other instruments of less accuracy.

For more strictly electrical engineering work the department will have the five-hundred light alternator used in lighting the college buildings, a direct-current "exciter" dynamo, all the apparatus of a complete fifty-five light Edison isolated electric lighting plant, a Sorley storage battery of twenty-six cells, one or two small electro-motors, both direct and alternating, arc and incandescent lamps, several standard forms of voltmeter, ammeter, and transformer, and two "pony" alternators for experimental purposes only.

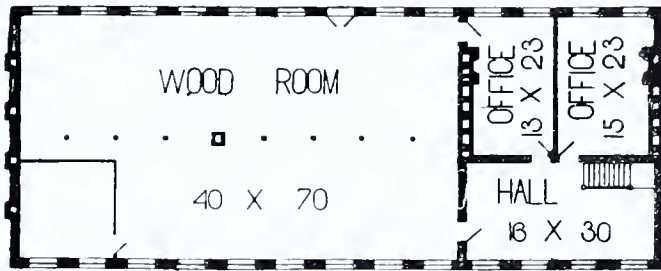
The zoölogical laboratory is well supplied with aquaria, microscopes, dissecting tools, charts, reference books, collections, etc.

The botanical laboratory is supplied with a good herbarium, microscopes, and the other necessary appliances.

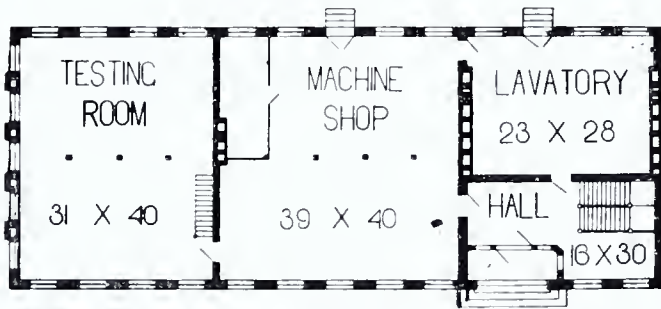
The surveying instruments are sufficient in number and of the most approved pattern.

MUSEUM.

The museum had for a nucleus the collections made during the state geological survey. To this, additions have been made from various sources. Many specimens are being collected to illustrate zoölogy — especially entomology. It will occupy a large, well lighted room in the main building.

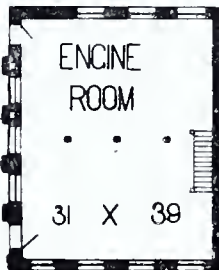


SECOND STORY

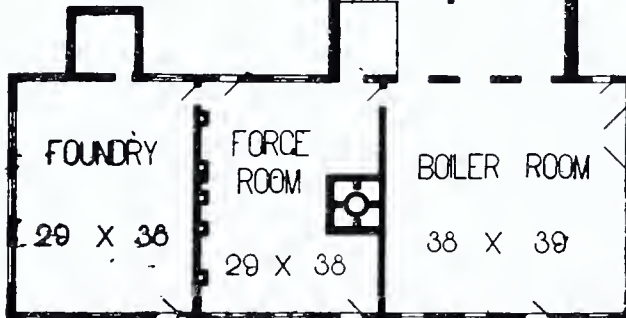
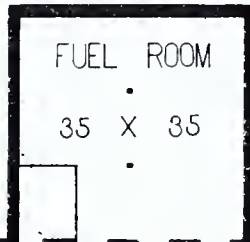


FIRST STORY

**FLOOR PLANS
SHOPS**



BASEMENT



**N. H. COLL. A. & M. A.
DURHAM N. H.**

LIBRARY.

The college has about three thousand bound volumes and is making purchases of books necessary to give good working libraries to the different departments of instruction, including economic science and English and American literature. It is hoped that several thousand volumes will be added before the opening of the college year at Durham.

Provisions have been made for a reading room to contain the representative dailies and the leading American and foreign periodicals.

FARM.

The farm contains more than three hundred acres of valuable land. It has been provided partly from the funds given by Hon. John Conant and partly from the Benjamin Thompson estate.

It is used for the purpose of an experiment station, for which it is considered by leading agriculturists as being especially fitted.

A model barn has been erected at an expense of about ten thousand dollars.

DONATIONS.

Acknowledgment is made of gifts from the following:

Mrs. Thomas Crosby, Hanover; Johnson's Dictionary, 2 volumes. 4°.

Prof. H. G. Jesup, Hanover; American Naturalist, 14 bound volumes; Essay and Travels, 7 volumes.

Miss M. E. Graves and Mrs. P. Coburn; a collection of geological specimens, curios, and minerals representing several years' continuous collecting by the late Dr. L. S. Graves, of Claremont. Two of the special features of this collection are the staurolites and the specimens of Vermont marble. The collection is to be placed in the museum and known as the Graves Collection.

B. F. Sturtevant & Co., Boston, Mass.; One Forge Blower for use in college blacksmith shop.

SITUATION AND RAILROAD CONNECTIONS.

Durham is situated on the western division of the Boston & Maine railroad, sixty-two miles from Boston and about midway between Newmarket Junction and the city of Dover, being five miles from the latter place.

From nearly every part of the State it is easily reached over the Boston & Maine and Concord & Montreal railroads. Each of these roads sells a transferable, unlimited, mileage ticket at the rate of two cents per mile.

RAILROAD DISTANCES TO DURHAM.

The entire distance is first given. The figures following show the miles over different roads. B. indicates Boston & Maine; C., Concord & Montreal; M., Maine Central; F., Fitchburg.

Concord, via Newmarket . . .	56 miles;	B.,	7;	C.,	49
Claremont, via Concord . . .	111	"	"	62;	" 49
White River Junct., via Concord	126	"	"	77;	" 49
Laconia, via Concord . . .	84	"	"	7;	" 77
Laconia, via Alton Bay . . .	53	"	"	33;	" 20
Woodsville, via Concord . . .	149	"	"	7;	" 142
Woodsville, via Alton Bay . . .	118	"	"	33;	" 85
Lancaster, via Concord . . .	192	"	"	7;	" 185
Lancaster, via Alton Bay . . .	161	"	"	33;	" 128
Lancaster, via North Conway .	135	"	"	74;	M., 61
Nashua, via Epping . . .	43	"	"	35;	C., 8
Keene,* via Hancock, Nashua, and Epping	99	"	"	91;	" 8
Keene, via Hancock, Nashua, Lowell, and Lowell Junction	121	"	"	121;	"

Keene, via Ayer, Mass., Nashua,
and Epping 117 miles; B., 53; C., 8
F, 56.

Keene, via Ayer, Mass., Low-
ell, and Lowell Junction . 124 “ “ 68; F., 56
Bellows Falls,* Vt., add 22 miles to distance from Keene.

PECUNIARY AID AND EXPENSES.

Tuition is \$60 per year, although numerous scholarships give free tuition to many New Hampshire students. The trustees have arranged the scholarships as follows: There are thirty Conant scholarships, each paying \$40 and tuition, \$60—total, \$100. These are to be assigned under the following conditions: 1st, they are to be given to young men taking an agricultural course; 2d, each town in Cheshire county is entitled to one scholarship, and Jaffrey is entitled to two; 3d, scholarships not taken by students from Cheshire county, and those in excess of the number of towns, are to be assigned to agricultural students at the discretion of the Faculty.

There are twenty-four senatorial scholarships—one for each senatorial district. Each scholarship is to pay \$20, and tuition, \$60—total, \$80. Senatorial scholarships not filled can be assigned to students from other localities at the discretion of the Faculty; they are open to students in all courses.

Early application should be made for these scholarships. They will be reserved for those respective towns and districts until August 1 of each year, after which they may be otherwise assigned for the year.

These scholarships are given for the purpose of aiding deserving students, and will be withdrawn from those who use tobacco or intoxicating liquors, or show themselves not deserving. Monitorships, janitorships, work on the farm, etc., also furnish assistance to a considerable extent.

* The train making connections via Hancock leaves Keene about 7.15 A. M. The latest train making connections via Ayer, Mass., leaves Bellows Falls, Vt., about 8.45 A. M., and Keene about 9.40 A. M.

Expenses may be estimated as follows:

Tuition	Free	\$60.00
Library and reading room tax	\$6.00	6.00
Room rent, including fuel	18.00 to	40.00
Board \$3 per week, for 35 weeks	105.00 to	122.50
Total	\$129.00	\$228.50

Room rent is estimated on the supposition that two students occupy the same room.

Rooms are generally unfurnished. Students bring bed-linen and blankets; second-hand furniture can be bought at low prices and sold at a slight reduction.

The cost of text-books, if obtained new, is about \$12 per year. As most of the students sell part of their books, the actual expense is from \$6 to \$10 per year.

For further information, address—Prof. C. H. PETTEE, Hanover, N. H.

NEW HAMPSHIRE AGRICULTURAL EXPERIMENT STATION.

This branch of the college is provided for by the National Government at an annual expense of fifteen thousand dollars.

The act of Congress provides, —

“ That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals ; the diseases to which they are severally subject, with the remedies for the same ; the chemical composition of useful plants at their different stages of growth ; the comparative advantages of rotative cropping as pursued under a varying series of crops ; the capacity of new plants or trees for acclimation ; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds ; the adaptation and value of grasses and forage plants ; the composition and digestibility of the different kinds of food for domestic animals ; the scientific and economic questions involved in the production of butter and cheese ; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states or territories.”

BOARD OF CONTROL.

HON. WARREN BROWN, <i>President</i>	.	Hampton Falls.
SIDNEY B. WHITTEMORE, Esq.	.	Colebrook.
HON. GEORGE A. WASON	.	Nashua.
CHARLES W. STONE, A. M.	.	East Andover.
PROF. GEORGE H. WHITCHER, <i>Secretary</i>	.	Durham.

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CLARENCE M. WEED, D. Sc., <i>Entomologist</i> .
DAVID E. STONE, B. S., <i>Station Farmer</i> .
EDWARD P. STONE, B. S., <i>Assistant Chemist</i> .
FRED D. FULLER, B. S., <i>Assistant in Chemistry</i> .

ENTRANCE EXAMINATION PAPERS.*

I. ENGLISH.

[The composition should be correct in spelling, grammar, and punctuation, and should show a clear purpose and an orderly method.]

1. Write at least three pages on one of the following subjects:

- (1.) The story of Evangeline.
- (2.) Was Brutus a traitor?
- (3.) Webster's style.

2. Correct the errors in the following sentences:

- (1.) The boy stood on the burning deck,
Whence all but he had fled.
- (2.) I am going and see him this afternoon.
- (3.) He hadn't seen what he had ought to do.
- (4.) Get up on to the platform.
- (5.) Try and read as many a good book as you can.
- (6.) I guess he will resign, for he told he was going to.

3. What is the proper difference (if any) in meaning between the two following?

I would do it if I could. I should do it if I could.

4. Which is the right expression:

He felt badly at his loss, or, He felt bad at his loss. If you substitute "discouraged" for "badly" or "bad" in the above, what part of a speech will it be?

* Given as specimens of average papers.

II. GEOGRAPHY.

1. Name and describe the river systems of North America.
2. Name the political divisions of Asia; give the situation of each.
3. Give a general description of Africa; state its size, situation, and physical characteristics.
4. What States of the United States may be called cotton States? what grain States?
5. What mountains between France and Italy? For what are they celebrated?
6. Give the situation of each of the following islands: Prince Edward, Jamaica, Vancouver, Sumatra.
7. Give the situation of each of the following seas: White, Aral, Yellow, Azof.
8. Give the situation of each of the following mountains: Ural, Carpathian, Caucasus, Kong.
9. Locate and describe each of the following rivers: Senegal, Volga, Indus, Clyde.
10. Locate and describe each of the following cities: Glasgow, Naples, Duluth, Tangiers.

III. AMERICAN HISTORY.

1. Give a brief account of the conquest of Peru.
2. What nations held territory in North America during the seventeenth century? What did each nation hold?
3. Give an account of King Philip's War.
4. Give an outline of the French and Indian War.
5. Give a brief but comprehensive account of the Siege of Yorktown (1781).
6. Give a brief account of the adoption of the Constitution.
7. Give the causes and results of the Mexican War.
8. Give a brief account of each acquisition of United States territory.
9. Give an account of the principal military operations during the year 1864.
10. Explain the Emancipation Proclamation and the Alabama Claims.

IV. PHYSIOLOGY.

1. Explain the structure of the bones. Name in their order those of the limbs.
2. Define the terms *cartilage*, *ligaments*, *tendons*.
3. Explain the process of digestion. What four solvents act upon the food?
4. How is the blood purified?
5. What is the origin of the nerves that regulate sensation and motion? What the origin of those that regulate digestion?
6. Describe the organ of hearing.
7. Describe the organ of sight.
8. What is the effect of alcohol upon digestion? upon the liver and kidneys?

V. ARITHMETIC.

1. Reduce $\frac{1^2 0 1^2}{10^3 7^4 0}$ to its lowest terms.
2. Divide $\frac{3}{2}$ of $\frac{5}{6}$ by $\frac{5}{3}$ and subtract the quotient from $\frac{2\frac{1}{2}}{4 - \frac{2}{3}}$.
3. How many hectares in a rectangular piece of land 500 feet long and 25 rods wide.
4. The population of a certain city is 100,000. It has gained 20,000; what has been the gain per cent?
5. Extract the square root of $\frac{6\frac{1}{4}}{2\frac{1}{4}}$ to five decimal places.
6. If 4 men build 19 rods of wall in $2\frac{1}{2}$ days, in how many days will 7 men build 20 rods?
7. A, B, and C formed a partnership, and cleared \$12,000. A put in \$8,000 for 4 months, and then added \$2,000 for 6 months; B put in \$16,000 for 3 months, and then withdrawing half his capital, continued the remainder for 5 months longer; C put in \$13,500 for 7 months. How divide the profits?
8. Find the simple, the annual, and the compound interest on \$1,000 for 2 years, 5 months, and 7 days, at 6 per cent.

VI. ALGEBRA.

Define Algebra, formula, coefficient, power, root, exponent, radical, term, factor, similar quantities.

2. From $3ax^2 - (4a - 2x)(x + 2a) + a[y - (a + 2y)]$ subtract $5a(x - y) + 3a^2 - 2x^2(a + 1)$.

3. Multiply $a^2x^{\frac{1}{3}} - 3x$ by $b + 2x^{-2}$.

4. Divide $4a^2y^3x^{\frac{2}{3}}$ by $-2a^3yx^2$.

5. $4x - 5y = 10$, and $3x + 12y = 7$. Solve for x and y .

6. Factor $a^3 - x^3$; $a^3 + x^3$; and $a^4 - x^4$.

7. The sum of two numbers is a , and their difference is b . What are the numbers?

8. Multiply $\sqrt{-x}$, $-\sqrt{-y}$, $-\sqrt{y}$, and \sqrt{y} .

9. $\sqrt{x - 16} = 8 - \sqrt{x}$. Solve for x .

VII. PLANE GEOMETRY.

1. Define geometry, proposition, theorem, problem, axiom, postulate, corollary, scholium, right angle, perpendicular, parallel, magnitude, and form.

2. Define trapezoid, rhombus, regular polygon, apothem, sector of a circle and segment of a circle. Name and explain the different kinds of triangles.

3. Give expressions for the circumference and area of a circle. State the relations existing between similar areas.

4. Demonstrate that if a perpendicular be erected at the middle of a line, any point in that perpendicular is equally distant from the extremities of the line; also that any point without, is nearer the extremity on its own side of the perpendicular.

5. Demonstrate that if two lines are cut by a third, making the sum of the interior angles on the same side of the secant line equal to two right angles, the two lines are parallel.

6. Demonstrate that in the same or equal circles two incommensurable arcs are to each other as the angles which they subtend at the centre.

7. Demonstrate that the opposite sides of a parallelogram are equal.

8. Demonstrate that triangles mutually equiangular are similar.

9. Construct a fourth proportional to three lines.

EXAMINATIONS FOR ADVANCED STANDING.

Students passing the examinations in Ancient, Mediæval, and Modern History can take French in place of the History of the first year.

I. ANCIENT HISTORY.

1. Describe the Accadian libraries and explain the manner in which they have been preserved.
2. Give an outline of the story of the War of the Seven against Thebes.
3. Compare the laws of Lycurgus with those of Solon.
4. Describe the different orders of Grecian architecture. Briefly describe the Parthenon.
5. Who were the great tragic poets of the Greeks? Upon what subjects did they write?
6. Give some account of the Stoics and the Epicureans.
7. Name and locate the natural entrances into the basin of the Mediterranean.
8. State the six provisions of the Licinian Laws. Which provisions were effective?
9. Give an outline of the history of the second Samnite War.
10. Locate and, with a sentence for each, describe the following: Olympia, Ægina, Delphi, Thebes, Tarentum, Pannonia, Numidia, Etruria, Mauritania, Sardinia.

II. MEDIÆVAL HISTORY.

1. Give an outline of the history of the kingdom of the Ostrogoths.
2. Explain the meaning of each of the following words: Janizaries, reliefs, escheats, aids, villeins.

3. What were the characteristics which distinguished the early Teutons?
4. Give an account of the Third Crusade.
5. In one hundred words, give the history of Spain from A. D. 700 to A. D. 1500.
6. In the same number of words give the history of the Wars of the Roses.
- 7-8. Describe the following, using about fifty words for each: Tamerlane, Warwick (the "king-maker"), Simon de Montfort, Huss.
9. Give an account of cathedral building.
10. Draw a map showing the political divisions of Europe at the close of the Middle Ages.

III. MODERN HISTORY.

1. Explain the causes that checked the progress of the Reformation.
2. Give an account of the battle of Lepanto.
3. Give an account of the religious changes which took place in England during the Tudor period.
4. Give the history of the siege of Leyden.
5. Give an account of Catherine de Medici.
6. Give the history of the war undertaken by Louis XIV against Holland.
7. Give an account of the English revolution of 1688.
8. Give a brief account of each of the revolutions in France since 1815.
9. Give an outline of the history of the unification of Italy.
10. Draw a map showing the southeastern part of Europe and the present political divisions.

PRIZE RECORD.

SMYTH PRIZES.

GIVEN BY HON. FREDERICK SMYTH, OF MANCHESTER, N. H.

ESSAY WRITING.

1881.	1st. George H. Whitcher.	2d. Henry L. Barnard.
1882.	1st. Edward P. Dewey.	2d. Harry L. Boutwell.
1883.	1st. Charles H. Woodward.	2d. Elmer D. Kelley.
1884.	1st. Herbert H. Kimball.	2d. Ernest S. Comings.
1885.	1st. Albert H. Wood.	2d. George P. Wood.
1886.	1st. Arthur W. Hardy.	2d. George A. Sanborn.
1887.	1st. Hiram N. Savage.	2d. Arthur W. Hardy.
1888.	1st. John W. Smith.	2d. Linwood C. Gillis.
1889.	1st. Not awarded.	2d. Not awarded.
1890.	1st. Edward P. Stone.	2d. Linwood C. Gillis.
1891.	Ernest G. Cole.	
1892.	Not awarded.	

ORATORY.

1881.	1st. Victor H. Stickney.	2d. George J. Boardman.
1882.	1st. Adams C. French.	2d. Frank L. Bigelow.
	3d. Edwin P. Dewey.	
1883.	1st. Frank L. Bigelow.	2d. Charles M. Woodward.
	3d. Adams C. French.	
1884.	1st. George E. Adams.	2d. { Ernest S. Comings. Moses B. Mann.
	3d. Ruel S. Alden.	
1885.	1st. Paul C. Brooks.	2d. George E. Adams.
	3d. Ruel S. Alden.	
1886.	1st. Edward H. Wason.	2d. James E. Harvey.
	3d. Arthur W. Hardy.	

1887. 1st. Bion L. Waldron. 2d. Arthur W. Hardy.
3d. Melvin B. Carr.
1888. 1st. Melvin B. Carr. 2d. John W. Smith.
3d. George J. Sargent.
1889. Not awarded.
1890. 1st. Joseph F. Preston. 2d. Edward P. Stone.
3d. Ernest G. Cole.
1891. 1st. Charles P. Brown. 2d. Edward P. Stone.
3d. Arthur B. Hough.
1892. 1st. Charles E. Hewitt. 2d. Orrin M. James.

READING.

1881. 1st. Charles L. Woodward. 2d. Frank L. Bigelow.
1882. 1st. Herbert H. Kimball. 2d. William S. Adams.
1883. 1st. Walter E. Angier. 2d. George W. Mullins.
1884. 1st. James E. Harvey. 2d. Madison T. Thurber.
1885. 1st. Galen D. Hull. 2d. Hiram N. Savage.
1886. 1st. Fred H. Colby. 2d. Arthur W. Stone.
1887. 1st. Fred H. Colby. 2d. Fred Washburn.
1888. 1st. William E. Kaleher. 2d. Joseph F. Preston.
1889. Not awarded.
1890. 1st. Charles P. Brown. 2d. { Wilton E. Britton.
Charles E. Hewitt.
1891. 1st. Orrin M. James. 2d. Charles E. Hewitt.
1892. 1st. Frank E. Austin. 2d. Fred W. Gunn.
3d. Frank S. Adams.

JESUP PRIZES.

GIVEN BY PROFESSOR JESUP FOR BEST HERBARIUMS.

1879. 1st. Edward A. Mack. 2d. Artemas T. Burleigh.
1880. 1st. Harlan A. Nichols. 2d. { Edwin P. Dewey.
George A. Loveland.
1881. 1st. Adams C. French. 2d. Lewis G. Flagg.
1882. 1st. { Ernest S. Comings. 2d. { Herbert N. Kimball.
James B. Wallace. George M. Moore.
1883. 1st. Andrew W. Brill. 2d. Walter E. Angier.
1884. 1st. James E. Harvey. 2d. George P. Wood.
1885. 1st. Albert A. Taft. 2d. Clinton H. Barrett.

1886.	1st.	Edwin C. Gerrish.	2d.	{ William N. Hazen. George E. Porter.
1887.	1st.	Fred Washburn.	2d.	{ John L. Norris. David E. Stone.
1888.	1st.	John Y. Jewett.	2d.	Elihu Q. Sanborn.
1889.	1st.	Russell M. Everett.	2d.	Henry A. Symonds.
1890.	1st.	for Class of '92, Fred D. Fuller.		
	1st.	for Class of '93, Charles E. Hewitt.		
1891.	1st.	Lucy E. Swallow.	2d.	F. W. Howe.
1892.	1st.	Emma M. Viau.	2d.	Frank C. Britton.

ALUMNI PRIZES.

ESSAY WRITING.

1883.	1st.	Elmore F. Arnold.	2d.	Charles M. Woodward.
1884.	1st.	Ernest S. Comings.	2d.	Herbert H. Kimball.
1885.	1st.	George E. Adams.	2d.	Albert H. Wood.
1886.	George P. Wood.			
1887.	Arthur W. Hardy.			

BAILEY CHEMICAL PRIZE.

GIVEN BY DR. C. H. BAILEY OF GARDNER, MASS., AND
E. A. BAILEY, B. S., OF WINCHENDON, MASS.

1888.	George E. Porter.
1890.	John Y. Jewett.
1891.	E. P. Stone.
1892.	F. D. Fuller.

CATALOGUE OF GRADUATES.

NOTE.—The arrangement is: (a) Name in full. (b) Degrees taken. (c) Residence at time of entering college. (d) Occupation, etc. (e) Present residence.

1871.

William Preston Ballard, B. S., Concord. Farmer. *Concord.*
 Lewis Perkins, B. S., Hampton. Civil Engineer. *North Adams, Mass.*
 Charles Henry Sanders, B. S., Penacook. Architect and Merchant. *Penacook.*

3—

1872.

Edwin Bartlett, B. S., Bath. Farmer. County Treasurer, 1883.
Kinsley, Edwards Co., Kan.
 Frank Alexander White, B. S., Bow. Farmer. *Bow.*

2—

1873.

Frederick Erasmus Eldredge, B. S., Kensington. Lawyer. *Tacoma, Wash.*
 James Fred Smith, B. S., A. M. (1885). Instructor in Iowa College. *Grinnell, Iowa.*
 Charles Henry Tucker, B. S., Plaistow. Carriage Maker. *Amesbury, Mass.*

3—

1874.

Millard Fillmore Hardy, B. S., Nelson. Graduated Theo. Inst. Ct., 1878.
 Clergyman. *West Boylston, Mass.*
 Henry Abbott Sawyer, B. S., North Weare. Business. *North Weare.*

2—

1875.

Walter Herman Aldrich, B. S., M. D. (Univ. N. Y. City, 1880), Troy.
 Physician. *Marlborough.*
 Frank Pierce Curtis, B. S., Stoddard. Manager of Store. *Greenfield, Mass.*
 Frank Veranus Emerson, B. S., Lebanon. Manufacturer. *East Lebanon.*
 Charles Webster Hardy, B. S., M. D. (Mo. Med. Coll., 1881), Marlborough.
 Physician. *Waterville, Kan.*

- Harvey Jewell, B. S., Winchester. Farmer. *Winchester.*
 Charles Ormille Leavitt, B. S.,* Lebanon. Farmer. Died, 1877.
 John Lomey McGregor, B. S., D. D. S. (Phila. Dental Coll., 1877), M. D.
 (1883), Whitefield. Physician. *Whitefield.*
 Eliel Peck, B. S., Lebanon. Farmer and Printer, 1875-80. Merchant.
Kimball, Minn.
 Ira William Ramsay, B. S., Walpole. Farmer. *Walpole.*
 Orlando Leslie Seward, B. S., Keene. Architect. *Keene.*
 Emery Mason Willard, B. S., Harrisville. Drug Clerk.

15 Union St., Boston, Mass.

11—* 1

1876.

- Herbert Cyril Aldrich, B. S., Troy. Insurance Agent. *Keene.*
 Edmund Lawson Brigham, B. S., Jaffrey. Manufacturer. *Clinton, Mass.*
 Joseph Warren Butterfield, B. S., Westmoreland. Farmer.
North Montpelier, Vt.
 Arthur Frank Chamberlain, B. S., Westmoreland. Commercial Traveler.
Jackson, Mich.
 Anson Ballard Cross, B. S., Holyoke, Mass. Paper Maker.
Readsborough, Vt.
 Warren Webster Kimball, B. S., Troy. Merchant. *Troy.*
 Daniel Deeth Parker, B. S., Fitzwilliam. Manufacturer. *Gardner, Mass.*

7—

1877.

- Rollin Kirk Adair, B. S., Indian Territory. Farmer.
Locust Grove, Cherokee Nation, Ind. Ter
 Homer Brooks, B. S., M. D. (N. Y. Hom. Med. Coll., 1881), Franconia.
 Physician. *342 Washington St., Haverhill, Mass.*
 John Washington Carson, B. S., Mont Vernon. Farmer. *Mont Vernon.*
 Charles Otto Chubert, B. S.,* Troy. Died.
 Charles Albert Edwards, B. S., LL. B.* (State Univ., Iowa, 1880), Keene.
 Lawyer. Died, 1886.
 William Francis Flint, B. S., Richmond. Farmer. *Winchester.*
 Clinton Camillus Hall, B. S., Westmoreland. Farmer. *East Westmoreland.*
 John Goodrich Henry, B. S., M. D. (1880), Chesterfield. Physician.
Winchendon, Mass.
 Charles Pitkin Hollister, B. S., North Montpelier, Vt. Farmer.
North Montpelier, Vt.
 George Mirick Holman, B. S., M. D., Fitchburg, Mass. Instructor in Bryant
 & Stratton's Commercial College. *Boston, Mass.*
 Charles Appleton Hubbard, B. S., Troy. Clerk. *Newton, Mass.*
 Charles Augustus Wheeler, B. S., East Calais, Vt. Farmer.
Bracken, Coral Co., Texas.
 Everard Whittemore, B. S., Fitzwilliam. Merchant. *Hudson, Mass.*

13—* 2

1878.

Ezra Eastman Adams, B. S., Manchester. Auctioneer.

237 and 249, Monroe St., Chicago, Ill.

Elmer Kilburn, B. S., C. E.,* Marlow. Civil Engineer. Died, 1881.

Charles Edward Record, B. S., Fitchburg, Mass. Farmer. *Fitchburg, Mass.*

3—* 1

1879.

Charles Hardy Bailey, B. S., M. D. (1881). Physician. *Gardner, Mass.*Richard Clinton Chapin, B. S., Chicopee, Mass. Agent for Nonotuck Paper Company. *Holyoke, Mass.*Lucius M. Cragin, B. S., Lempster. Farmer. *Springfield, Vt.*

Nathaniel Cutter Holmes, B. S.,* Amherst. Lawyer. Died, 1887.

Fred Charles Parker, B. S., Lempster. Merchant. *Acworth.*George Henry Wilkins, B. S., M. D. (N. Y. Hom. Med. Coll., 1883), Amherst. Physician. *Palmer, Mass.*

6—* 1

1880.

Charles Harvey Hood, B. S., Derry. Farmer.

Derry.

1—

1881.

Edwin Thomas Aldrich, B. S., Troy. Insurance Clerk.

Keene.

Henry Lyman Barnard, Troy. Clerk.

Troy.

George Jordan Boardman, B. S.,* Lawrence, Mass. Medical Student. Died, 1886.

Edwin Franklin Bristol, B. S., Harwinton, Conn. Mechanic.

Ascutneyville, Vt.

Artemas Terald Burleigh, B. S., Franklin. Merchant.

Tilton.

Frank Dana Ely, B. S., Cavendish, Vt. Business.

Cavendish, Vt.

Sanford Eugene Emery, B. S., LL. D. (Albany Law School, 1886), Proctorsville, Vt. Lawyer.

Proctorsville, Vt.

Charles Herbert Hazen, B. S., Hartford, Vt. Farmer.

Hartford, Vt.

Frank Marston, B. S., Hartford, Vt. Business.

Olcott Falls, Vt.

William Augustus Megrath, B. S., M. D. (1885), Cavendish, Vt. Physician.

Loudon.

Fred Townsend Stanton, B. S., Strafford. Farmer.

Strafford Corner.

Victor Hugo Stickney, B. S., M. D. (1883), Tyson, Vt. Physician.

Dickinson, Dak.

Samuel Austin Wallace, B. S., Ph. G. (Boston School of Pharmacy, 1886), West Hartford, Vt. Druggist.

Crookstone, Minn.

George Herbert Whitchee, B. S., Strafford. Professor of Agriculture, and Director of Experiment Station.

Durham.

14—* 1

1882.

- Harvey Lincoln Boutwell, B. S., LL. B. (Boston Univ., 1886), Hopkinton.
Lawyer. *209 Washington St., Boston, Mass.*
- Dana Justin Bugbee, B. S., North Pomfret, Vt. Agent for Publishers.
North Pomfret, Vt.
- Robert Fletcher Burleigh, B. S., D. V. S. (Am. Veterinary College. 1885),
M. D. (1887), Franklin. Instructor in Veterinary Science, 1885-88.
Professor of Physiology and Veterinary Science, Kansas State Agricultural College, 1888-89. Physician. *Rochester.*
- La Forrest John Carpenter, B. S., Surry.
- Edwin Preston Dewey, B. S., Hanover. Teacher. *Etna.*
- George Andrew Loveland, B. S., LL. B. (Univ. of N. Y., 1886), Norwich, Vt.
Weather Bureau. *Crete, Neb.*
- John Wright Mason, B. S., Hanover. Business. *Des Moines, Iowa.*
- Harlan Addison Nichols, B. S., Derry. Weather Bureau. *Colorado, Texas.*
- Frank Elmer Thompson, B. S., Stark. Lumberman. *Ridgeway, Penn.*

9 —

1883.

- Elmore Ferdinand Arnold, B. S., M. D. (Univ. City, N. Y., 1885), Londonderry, Vt. Physician. *Londonderry, Vt.*
- Frank Landor Bigelow, B. S., Proctorsville, Vt. Instructor in Mathematics and Sciences, Goddard Seminary, Barre, Vt., 1883-86. Business.
Rutland, Vt.
- Frederick Stocks Birtwhistle, B. S., Troy. With Automatic Fire Alarm and Extinguisher Co. *620 Atlantic Avenue, Boston, Mass.*
- Noice D Bristol, B. S., Harwinton, Conn. Clergyman. *Hamilton, Kan.*
- Fred Plummer Comings, B. S., Lee. Teacher. *South Yarmouth, Mass.*
- Frank Harry Follansbee, B. S., Canaan. Farmer. *Canaan.*
- Adams Clark French, B. S., Franklin Falls. Theological student.
Chicago, Ill.
- James Edgar Gay, B. S., Tunbridge, Vt. Woolen Manufacturer.
Cavendish, Vt.
- Elmer Daniel Kelley, B. S., Franklin Falls. Farmer. *Franklin Falls.*
- Alvah Benjamin Morgan, B. S., Canaan. Drug Clerk. *Lebanon.*
- William Lincoln Whittier, B. S., Deerfield. Farmer. *Deerfield.*
- Charles Minot Woodward, B. S., Hanover. Instructor in Agriculture, 1883-84. Teacher. *Grosbeck, Texas.*

12 —

1884.

- Ernest Smith Comings, B. S.,* Lee. U. S. Signal Service. Died 1886.
- Fred Carlos Davis, B. S., South Reading, Vt. Lawyer. *Springfield, Vt.*
- Sylvester Miller Foster, B. S., Riverhead, L. I. Insurance Agent.
Riverhead, L. I.
- Herbert Harvey Kimball, B. S., Hopkinton. Weather Bureau.
Washington, D. C.

Moses Bisbee Mann, B. S., Benton. Custom House Official. *Boston, Mass.*
 George Milton Moore, Plymouth, Vt. Merchant. *Tyson, Vt.*
 Ziba Amherst Norris, B. S., Lyme. Merchant.

1677 Washington St., Boston, Mass.

Edwin Chapin Thompson, B. S., Lee. Weather Bureau.

Fort Supply, Ind. Ter.

8—* 1

1885.

George Ellsworth Adams, B. S., Weston, Vt. Weather Bureau.

Fort Duchesne, Utah.

Ruel Seabury Alden, B. S., Lyme. Superintendent of Asylum Farm.

Concord.

Walter Eugene Angier, B. S., C. E. (1887), West Swanzey. Civil Engineer.

Memphis, Tenn.

Edward Alonzo Bailey, B. S., West Swanzey. Attendant in Insane Asylum.

Winchendon, Mass.

Phillips Greenleaf Bickford, B. S., Lyme. Teacher. *Farmington, Wash.*

Andrew Walter Brill, B. S., Riverhead, L. I. Seedsman and Florist.

Floral Park, Queens Co., N. Y.

Paul Cuff Brooks, B. S., Boston, Mass. Clerk.

25 Westminster St., Boston, Mass.

Frank Jay Emerson, B. S., Epping. Clerk.

Portsmouth.

Allen Hazen, B. S., Hartford, Vt. Chemist of State Board of Health.

Lawrence, Mass.

George Mayo Mullins, B. S., Londonderry. Farmer. *North Londonderry.*

Albert Henry Wood, B. S., Lebanon. Associate Professor of Agriculture.

Durham.

11—

1886.

Frank Albert Davis, B. S., South Lee. Weather Bureau. *Boston, Mass.*

James Ellsworth Harvey, B. S., Surry. Photographer. *Surry.*

Beleazar Stoianoff Ruevsky, B. S., Sistova, Bulgaria. Student of Veterinary
 Science. *Sistova, Bulgaria.*

Madison Templeton Thurber, B. S., Webster. Physician. *Grafton.*

Edward Hills Wason, B. S., New Boston. Lawyer. *Nashua.*

George Pillsbury Wood, B. S., Lebanon. Civil Engineer. *Roanoke, Va.*

6—

1887.

William Sprague Currier, B. S., Norwich, Vt. Weather Bureau.

Cleveland, Ohio.

Arthur Woodbury Hardy, B. S., C. E. (1889). Hopkinton. Civil Engineer.

City Engineer's Office, Salt Lake City, Utah.

- George Albert Sanborn, B. S., Rochester. Teacher. *Rochester.*
 Hiram Newton Savage, B. S., White River Junction, Vt. Engineer of San
 Diego Land Improvement Co. *National City, Cal.*
 Bion Leland Waldron, B. S., Strafford. Weather Bureau. *Oswego, N. Y.*

5—

1888.

- Melvin Burnside Carr, B. S., North Haverhill. *Boston, Mass.*
 Herbert Grant Davis, B. S., South Lee. Farmer. *South Lee.*
 Edwin Chandler Gerrish, B. S., Webster. Civil Engineer. Office of Locks
 and Canals. *Lowell, Mass.*
 William Nelson Hazen, B. S., C. E. (1890), Hartford, Vt. Civil Engineer.
East Berlin, Conn.
 Edward David O'Gara, Hanover. Farmer. *Hanover.*
 George Elmer Porter, P. S., M. D. (1892). Hartford, Vt. Physician.
Chatham, Mass.
 George Jonathan Sargent, B. S., Canterbury. Civil Engineer. Office of Locks
 and Canals. *Lowell, Mass.*
 John Warren Smith, B. S., Grafton. Weather Bureau. *Boston, Mass.*
 George Elwin Walker, B. S., Littleton. Farmer. *Littleton.*

9—

1889.

- Fred Harvey Colby, B. S., Hopkinton. Civil Engineer.
708 7 St., Tacoma, Wash.
 Linwood Carroll Gillis, B. S., Manchester. Journalist.
37 Appleton St., Manchester.
 Louis Jerome Hutchinson, B. S., Norwich, Vt. Electrician. *Boston, Mass.*
 John Lawrence Norris, B. S., Lyme. Clerk.
1677 Washington St., Boston, Mass.
 Charles Walter Earl Scott, B. S., Winchester. Clerk. *Winchester.*
 David Elmer Stone, B. S., Hartford, Vt. Station Farmer. *Durham.*
 Fred Washburn, B. S., West Springfield. Business. *Laconia.*

7—

1890.

- John Young Jewett, B. S., Gilford. Student in Thayer School of Civil Engi-
 neering. *Hanover.*
 Joseph Franklin Preston, B. S., Hanover. Clerk.
570 Columbus Avenue, Boston, Mass.
 Elihu Quimby Sanborn, B. S., Webster. Machinist.
 Clarence Ira Slack, B. S., Norwich, Vt. With Vermont Marble Co.
West Rutland, Vt.

4—

1891.

Ernest Gowell Cole, B. S., Hampton.	Merchant.	<i>Hampton.</i>
Russell Marden Everett, B. S., Chester.	Teacher.	<i>Chester.</i>
Edward Payson Stone, B. S., Canaan Centre.	Assistant Chemist of Experiment Station.	<i>Durham.</i>

3—

1892.

Percy Lovejoy Barker, B. S., Milford.	Student in Thayer School of Civil Engineering.	<i>Hanover.</i>
Fred Driggs Fuller, B. S., Hanover.	Assistant in Chemistry. Experiment Station.	<i>Durham.</i>
Arthur Bennerzett Hough, B. S., Lebanon.	Farmer.	<i>Lebanon.</i>
Edward Monroe Stone, B. S., Marlborough.	Student in Thayer School of Civil Engineering.	<i>Hanover.</i>

4—

SUMMARY.

	Living.	Dead.	Total.
Graduates (1871-92, inclusive)	136	7	143
Clergymen			2
Lawyers			5
Physicians			13
Professors of Agriculture			2
Others connected with Agriculture			28
Other teachers			8
Civil and Mechanical Engineers			12
Architects			2
Chemists			3
Electrician			1
Journalist			1
Manufacturers and Mechanics			8
Weather Bureau			9
Business pursuits			38
Unclassified			2
Unknown			2
Students in attendance, October, 1890, to October, 1892			61
Number connected with college, 1871 to 1892 (inclusive)			327



